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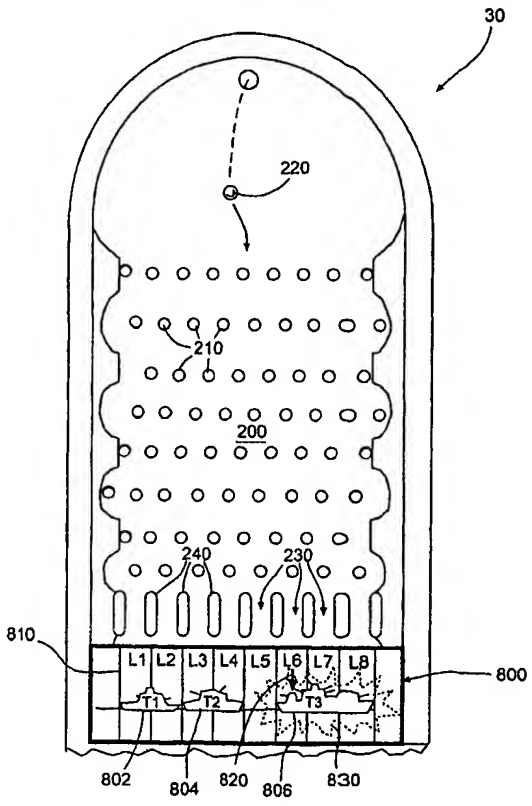

(57) Abstract: A bonus game (30) for an underlying base casino machine (20) played by a player wherein the bonus game (30) provides a Pachinko playing field (200), a ball (220) propelled onto the Pachinko playing field (200) when a bonus condition occurs during play of an underlying casino game (20). The Pachinko playing field (200) having a row of lanes (230) so that the ball (220), after traversing the playing field (200), travels through one of the lanes (230). A display (800) at said row of lanes (230) on said playing field (200) for displaying at the lanes (230), targets (T1-T3), digits (1100) used to form a decimal number, graphic symbols (1130) used to perform a mathematical operation, symbols appearing in the underlying game outcome, so as to provide awards (1270), wild symbols (W), extended game play, etc. A seal card game having a number of play areas (130',132',134', 136',138'), with each play area having a hidden symbol (100',140').

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PACHINKO STAND-ALONE AND BONUSING GAME WITH DISPLAYED TARGETS PLUS SEAL CARD GAME

BACKGROUND OF THE INVENTION

1. Field of the Invention. The present invention relates to Pachinko games and, in particular, to a Pachinko stand-alone game and to a Pachinko bonus game for an underlying game such as a slot machine. It also relates to seal card games and, specifically, to scratch lottery tickets.

2. Statement of the Problem. Slot machine bonusing features have become popular, and examples of their success include WHEEL OF GOLD, WHEEL OF FORTUNE, JEOPARDY!, REEL 'EM IN, PIGGY BANKIN', and many others. What has been heretofore lacking is a bonus game which utilizes the excitement and dynamic qualities of Pachinko. A need exists to provide a form of Pachinko as a bonus game for an underlying game such as a slot machine.

One problem associated with Pachinko games is that wear and tear caused by repeated play causes bias to occur wherein a ball may more frequently pass through certain lanes rather than through other lanes. A need exists to provide random payoffs during the play of Pachinko whether as a bonus game for an underlying game or as a stand-alone game despite bias caused by wear and tear.

A need also exists to provide additional excitement to the conventional play of a game such as video poker, slot machines and the like by providing additional random play in the dispensing of different values when a winning combination on the game is obtained.

Scratch lottery tickets are used principally by governmental entities to generate revenue therefor. A ticket is purchased at a retail

establishment by a consumer upon payment of value such as $1.00, $2.00, $5.00, or $10.00. According to the instructions on the ticket, the consumer then scratches off a removable material from selected areas to reveal hidden play symbols on the ticket. When a win occurs, corresponding award area is scratched off to reveal a payoff value. The player takes the ticket to an establishment for redemption.

A pull ticket is used in the casino gaming world. Pull tickets require removing a cover member such as a top or a flap to reveal a hidden play symbol. The term "seal card game" herein refers to scratch lottery tickets, to pull tickets, or to any other similar ticket. A continuing need exists to provide new and exciting seal card games to consumers.

3. Solution to the Problem

The present invention addresses the aforesaid needs. The Pachinko bonus game of the present invention is placed near an existing slot machine such as on top of, at the rear of, side-by-side with, or located near (such as on a wall). The Pachinko bonus game is started when an initiation condition such as when a symbol or combination of symbols align on the payline of the slot machine. The payoff selection and display on a per game basis is random so that biasing caused by wear and tear is eliminated whether the Pachinko game is played as a bonus game or as a stand-alone game. The Pachinko game can be used to dispense payoffs for conventional winning combinations of the underlying game. The present invention also meets the continuing need to provide a new and exciting seal card game to consumers.

SUMMARY OF THE INVENTION

The present invention pertains to a Pachinko bonus game system for an underlying game machine (such as a slot machine) being played by a player. The underlying game machine has a credit meter. The Pachinko bonus game system provides a playing field wherein the playing field has a plurality of rows of pegs with each row of pegs staggered from each adjacent row. A ball is launched onto the playing field by a launch mechanism. The launching or propelling of the ball onto the playing field occurs when an initiate condition occurs during play of the underlying game. In the case of a slot machine, the initiate condition can be the appearance of a special symbol on the payline. A number of different initiate conditions can be utilized based upon the underlying game. A row of lanes are provided on the playing field. The ball, after traversing among the pegs on the playing field, eventually travels through one of the lanes. At each lane is displayed a bonus payoff value. The lane the ball travels through senses the presence of the ball and the value displayed for that lane is added to the credit meter. The bonus payoff values are displayed at each lane with a flush mounted display so as not to interfere with or impede the travel of the ball through the lane. The bonus payoff values are randomly changed which would eliminate any mechanical bias present in the Pachinko game.

The Pachinko stand-alone game operates independently of an underlying game and is conventionally activated by a player to play the game. However, the playing field, ball, launch mechanism, rows of lanes, and the payoff display are as described above for the Pachinko bonus game with the exception of the credit meters in the Pachinko stand-alone game.

A bonus game for an underlying base casino machine played by a player wherein the bonus game further provides a Pachinko playing field, a ball propelled onto the Pachinko playing field when a

bonus condition occurs during play of an underlying casino game. The Pachinko playing field having a row of lanes so that the ball, after traversing the playing field, travels through one of the lanes. A display at said row of lanes on said playing field for displaying at the lanes, targets, digits used to form a decimal number, graphic symbols used to perform a mathematical operation, symbols appearing in the underlying game outcome, so as to provide awards, wild symbols, extended game play, etc. Variations of the bonus game are found in scratch lottery tickets, standalone casino games, and features to gaming machines and systems.

And in yet another embodiment of the present invention, the Pachinko game system operates as a payoff dispenser for a conventional game.

A seal card game is played on a ticket that has a number of play areas. Each play region has hidden symbols under play areas. Only one of the hidden symbols on the ticket is a directional symbol. The other hidden symbols are end of game symbols. The player has only one opportunity to uncover (such as by scratching to remove material to reveal) a hidden symbol in one play area. Uncovering an end of game symbol ends the game. Uncovering the directional symbol entitles the player to continue play and to uncover a number of authorized award areas located within a topological area in an award region on the ticket. Upon redeeming the ticket, the player receives the authorized awards in the topological area based on a predetermined mathematical operation.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates the Pachinko bonus game of the present invention associated with a slot machine.

Figure 2 is a front view of the Pachinko bonus game of the present invention.

Figure 3 is a front view of a second embodiment of the Pachinko bonus game of the present invention.

Figure 4 is a block diagram of the interconnection showing the components of the Pachinko bonus game connected to the slot machine.

Figure 5 is an operational flow chart for the Pachinko bonus game of the present invention.

Figure 6 is a block diagram of the stand-alone Pachinko game of the present invention.

Figure 7 is an operational flow chart for the stand-alone Pachinko game of the present invention.

Figure 8 illustrates another embodiment of the Pachinko bonus game of the present invention.

Figure 9 is a front view of the base game screen showing random objects.

Figure 10 is an operational flow chart for the bonus game of Figures 8 and 9.

Figure 11 is an embodiment of the present invention showing three sequential balls selecting digits of a decimal number.

Figure 12 sets forth the operational flow chart for the bonus game of Figure 11.

Figure 13 is an illustration of embodiment of the present invention showing a graphic controlling a mathematical computation to generate an award.

Figure 14 is a variation of the embodiment shown in Figure 13.

Figure 15 sets forth a variation of the embodiment of Figure 13.

Figure 16 sets forth a scratch lottery ticket embodiment of the embodiment of Figure 13.

Figure 17 is a scratch ticket variation of the embodiment of Figure 14.

Figure 18 sets forth an embodiment of the present invention wherein the bonus game interacts with the base game.

Figure 19 sets forth another embodiment wherein the bonus game interacts with play of the base game.

Figure 20 sets forth an operational flow chart for the bonus/base interaction games of Figures 18 and 19.

Figure 21 sets forth a planar view of a seal card in the form of a scratch lottery ticket of the present invention.

Figure 22 is a planar view of a seal card in the form of a scratch ticket variation of the embodiment of Figure 21.

Figure 23 is a method flow chart for play of the seal card game of the present invention.

Figure 24 is a planar view of a seal card according to another embodiment of the present invention.

Figure 25 is a planar view of a seal card according to yet another embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Overview

In Figure 1, the system 10 of the present invention is shown to include an underlying game such as a conventional slot machine 20 modified according to the teachings herein and a Pachinko bonus game 30 also modified according to the teachings herein. In Figure 1, which represents one embodiment of the present invention, the Pachinko bonus game 30 is vertically mounted at the rear of a slanted slot machine 20. The Pachinko bonus game is located at the slot machine 20. The term "at" includes locating the Pachinko bonus game 30 "at the rear of," "on top of," "side-by-side with" or "near" the underlying game 20. Furthermore, one Pachinko bonus game 30 could be used with a number of underlying games 20 such as twenty slot machines. In which case, the Pachinko bonus game would be mounted at a central location such as on a wall above the slot machines. Furthermore, the underlying game 20 can be any suitable game such as, but not limited to: slot machines, video poker, and other automated gaming machines, live-table games, and other games of chance. In the following the configuration of Figure 1 is used to illustrate the teachings of the present invention. For example, the Pachinko bonus game could be located near the slot machine 20, such as mounted on a wall and connected thereto by a cable.

The adjacent slot machine 20 functions conventionally when taking wagers, making payments and being played. The slot machine 20 has a conventional credit meter 24 which displays the player's current credits. Slot machines 20 are conventional and are made by a number of different manufacturers. How and in what form (i.e., coin-ins, dollar acceptors, magnetic cards, smart cards, etc.) wagers are placed at the slot machine 20 by a player is immaterial to the teachings of the present invention. What is material is that the credit meter 24 of the slot machine 20 is modified to increase when the

player wins at the Pachinko bonus game 30. In addition, should an initiation condition arise during play of the slot machines such as a special symbol 26 (or set of symbols) appearing on the payline 22 of the slot machine 20, it automatically activates the Pachinko bonus game 30 (and deactivates the slot machine 20) so that the player of the slot machine 20 can play the Pachinko bonus game 30. Other means to "initiate" the Pachinko bonus game 30 are possible. The occurrence of a "winning combination" in the underlying game such as "two cherries" in a slot machine, or "twenty-one" in a blackjack game, or "three twos" in joker poker. The occurrence of the player accumulating a predetermined amount of winning such as "seventy-seven" dollars (or coins) in the underlying game. The occurrence of a symbol such as a "bonus" symbol appearing anywhere in the window or field of view in a slot machine even if it is not on the payline or receiving a card in a card game having a bonus symbol on it. The occurrence of an event such as a random signal to participate in the bonus game.

When utilized as a bonusing mechanism, the preferred Pachinko bonus game 30 embodiment utilizes one ball 220, which is propelled up onto a playing field 200 comprising alternately spaced rows of pegs 210. After traversing the playing field 200, the ball 220 falls through one of a plurality of chutes or lanes 230 separated by bumpers 240. The player receives an appropriate bonus payoff corresponding to the lane 230 the ball 220 travels through. The bonus payoff is credited to the slot game meter 24. The bonus game 30 ends and play reverts to the slot machine 20. The Pachinko game could also have a separate credit meter which is selectively incremented.

Details of Pachinko Game 30

In Figure 2, the Pachinko bonus game 30, in the preferred embodiment, has eight payable lanes 230: L1 – L8. Any suitable

number of lanes 230 could be used such as but not limited to 6, 10, 13, etc. The displays 250 shows the payoffs in each of the eight lanes to the player. Each payoff display 250 is a digital meter which is flush mounted in the field 200 so as not to interfere with the ball 220. The displays 250, in some embodiments, may be located in a separate viewing area on the Pachinko bonus game 30 although it is preferred to have the displays 250 located at (i.e., in, above, or near) the lanes 230 so that a player may easily view the bonus payoff for that lane. The display 250 is a conventional digital display such as an LED and it may be circular, square, or any suitable shape or design. It is to be expressly understood that in certain embodiments of the present invention, the display 250 can be simply printed with fixed bonus payout values. As will be explained in the following, in the preferred embodiment the displays 250 are utilized to display individual payout values 260 for each lane 230. Furthermore, the actual design of the field 200 for the Pachinko bonus game 30, as is conventionally done, varies considerably from manufacturer to manufacturer. Hence, the present invention is not meant to be limited by the design characteristics of the Pachinko game 30.

In the preferred embodiment, the Pachinko game 30 of Figure 2 becomes activated when an initiation condition occurs in the underlying game 20. For example, in Figure 1, the appearance of a dollar sign 26 anywhere on the payline 22 allows the player to play the Pachinko bonus game 30. Any symbol or combination of symbols may be used to activate the Pachinko bonus game 30 such as, but not limited to, a graphic Pachinko symbol, a four-leaf clover, or the word "bonus." When the Pachinko game is activated, a light and sound campaign can be used to signal to people in the vicinity of the player's opportunity to play the Pachinko bonus game 30. The player pushes button 28 to activate the firing mechanism 270 which launches the ball 220 upwardly in area 280 and onto the playing field 200. In another design, the ball launch is automatic and occurs automatically after the

initiation condition occurs. Assume in Figure 2, that the ball 220 is directed through lane L6 in which case the player receives the payoff 260 displayed in display 250 of $80 (or 80 coins). The credit meter 24 of the slot machine 20 is then incremented by the value of the payoff. The payoff could also be made in coupons, tickets, free plays, etc. In which case, the credit meter 24 would not be incremented. It is to be understood that a separate credit meter, not shown in Figure 4, but shown in Figure 6, could be utilized to keep track of the bonus payoffs.

The ball 220 is preferably three-quarters of an inch to one and one-half inch in diameter (i.e. about one inch). For example, in games 30 mounted on a wall, the ball 220 and pegs 210 would be scaled up such as having wider lanes. The pegs 210 are preferably on one and one-half to two-inch centers and each peg is preferably three-sixteenths an inch in diameter. Each row of pegs 210 is preferably staggered from the adjacent row above and below by one-half the center-to-center distance between pegs 210. These dimensions illustrate the present invention and are not meant to limit the teachings thereof. While the present invention uses one ball 220 per bonus, it is to be understood that more than one ball 220 could be used and that more than one ball 220 could be simultaneously or successively launched.

It is important to prevent outside influences from affecting the operation of the Pachinko bonus game 30 such as 1) possible tilting of the Pachinko game 30 to coax the ball 220 into desirable lanes 230 and 2) possible use of magnets to coax a steel or magnetic ball. Both of these concerns are eliminated in the present invention by using leveling sensors and a non-magnetic ball 220. While the use of plastic is preferred, the teachings of the present invention are not limited to plastic and other non-magnetic materials may be used. Furthermore, the algorithms and methods contained herein would also apply to conventional steel balls. Hence, the teachings of the present

invention are not to be limited to use of either plastic balls or leveling sensors.

Algorithms

Algorithms for assigning the bonus game 30 values 260 to the lanes L1 – L8 include, but are not limited to, the following three algorithms:

Algorithm No. 1

The slot machine 20 assigns a random payoff value 260 to the bonus game 30, either before or during play, that is independent of the outcome of the Pachinko action. After the ball 220 travels through a lane 230, the predetermined random payoff value 260 is displayed in display 250. Under this algorithm, the value of bonus payoffs is not determined by the ball 220 play in the Pachinko game.

Algorithm No. 2

Bonus payoff values 260 are randomly assigned to each lane 230 as a function of time and based upon game play. The value 260 for the bonus game 30 is determined by the displayed lane value at the time the ball 220 passes through a lane 230. This algorithm can either be free running (i.e., continuously) or start when the Pachinko bonus game 30 is activated. If free running, the cycle time for displaying a set of bonus payoffs 260 in displays 250 is preferably less than the typical Pachinko bonus game cycle time. For example, if it takes an average five seconds to play the Pachinko bonus game 30, then the payoff cycle time could be two seconds. In this example, every two seconds new payoffs 260 would be randomly displayed in displays 250. The display cycle time cannot be too fast since it must be viewed by a player, nor can it be too slow, if free running, since a player could take advantage of high payout values. Under the teachings of the present invention, the display cycle time, T_D, is preferably less than the game cycle time, T_G, or $T_D \leq T_G$.

It is to be understood that the display in each lane could change at the same time; or the display in each lane could change at staggered times. For example, the first lane at time T_0, the second lane at time $T_0 + T_S$, the third lane at time $T_0 + 2T_S$, etc.; where T_S is a predetermined stagger time period. This creates a flickering effect which is aesthetically pleasing.

In yet another embodiment, the time a value is displayed in a lane is constant (equal), but the frequency of selection is based upon the weight of the value. For example, if the values are ten dollars and one hundred dollars and the respective weights are 50% and 5%, then each value is displayed for the same amount of time (e.g., two seconds), but the ten-dollar value is displayed 50% of the overall time and the one hundred dollar value is displayed 5% of the overall time.

In yet another embodiment, the weight for each lane is constant (equal), but the frequency of selection is based upon time. For example, if the values are ten and one hundred dollars and the respective weights are each 50%, then each value has the same probability of being displayed, but the time of displaying the ten-dollar value is much longer than the time for displaying the one hundred dollar value.

Algorithm No. 3

Bonus payoff values 260 are assigned and displayed in displays 250 to each lane 230 randomly, via a weighted probability pay table, at any time after the bonus game 30 is activated and before the ball 220 travels through a lane 230. These bonus payoff values 260 remain fixed and the lane 230 selected by the ball 220 determines the ultimate payoff amount for the bonus game.

Algorithm No. 3 is the preferred embodiment for determining bonus payoff values 260 in that it allows players to see what bonus payoffs are possible, and to root for the ball 220 to settle into lanes 230 with high potential payoffs. It also gives players reassurance in

knowing that no "funny business" is taking place (i.e., after launch the values 260 are fixed and known to the player, and subsequently the ball 220 – and the ball 220 alone – determines the bonus payoff 260 the player will receive).

Bonus Payoff Values 260 Details Based on Algorithm No. 3

The above three algorithms are preferred embodiments. Other algorithms could be equivalently used under the teachings of the present invention.

Assume the desired average bonus payoff value for the Pachinko bonus game 30 is D units. The term "units" is used to refer to any suitable bonus payoff form such as monetary value (dollars), numbers of coins (number of quarters), tickets, etc. The teachings of the present invention are not limited to the form of the bonus payoff. Two preferred methods are used to determine the payoff.

Method 1: This method assigns bonus payoff values 260 to each lane 230 such that the expected value per lane 230 remains at D units, while particular bonus payoff values fluctuate above and below D units. In this fashion, the average value per game still remains at D units, but players experience variety in game play.

In Method 1, the average value per game remains equal to D units regardless of any bias which may exist or which may develop in the Pachinko bonus game 30 toward the lanes 230 and is accomplished in the following manner.

Let the number of lanes be N_L and the number of payoffs for lane l be R_l. The set of payoffs and their associated weights (i.e., probabilities) for lane l is $P_{l,k}$ and $w_{l,k}$, where k is an index assuming values from 1 to R_l. Let the desired average value for the game be D. Then for each lane l the expected value becomes:

$$EV_l = \sum_k (w_{l,k} \times P_{l,k}) \equiv \text{a constant}$$

FORMULA 1

where EV_l = Expected Value for lane l

$P_{l,k}$ = Set of rewards for lane l

$w_{l,k}$ = Weights per lane l

Summing over the game lanes, with unknown probabilities of occurrence W_l, yields the expected value per game:

$$EV = \sum_l (w_l \times EV_l) = EV_l \times \sum w_l = EV_l$$ FORMULA 2

Thus EV for the game is simply that of each lane, provided this is constant (i.e., equal for each lane). Furthermore, EV is independent of the weights w_l of occurrence for each lane. Thus any bias developing through wear and tear which affects the w_l has no bearing on EV. With no multiplier (M = 1), the solution is EV = D. This is an important advantage of the present invention that the bonus payoff values 260 of the game are unaffected by physical wear and tear of the associated hardware. That is, even if the Pachinko bonus game 30 becomes biased toward one or more lanes 230, the bonus payoff value 260 of the game is unchanged. Randomness and fairness to the house and to the player is maintained. In the worst case of bias, the ball would fall through the same lane, game after game, yet the value, D, for the game is recovered.

Assume the Pachinko bonus game 30 has a value, per play, of EV = D = 50 units, then the following is an example of random assignments for each lane L1 – L8 of Figures 1 and 2:

Table I

	Weights/Lane								
Payoff	L1	L2	L3	L4	L5	L6	L7	L8	
10	0.15	0	0	0.7	0	0	0	0	
20	0.1	0	0	0	0	0	0	0.1	
30	0.1	0	0.25	0.1	0.2	0.4	0	0.6	
40	0.1	0	0	0	0.2	0.2	0.5	0	
50	0.1	1	0.5	0	0.2	0	0	0	
60	0.1	0	0	0	0.2	0	0.5	0	
70	0.1	0	0.25	0	0.2	0.2	0	0	
80	0.1	0	0	0	0	0.2	0	0	
90	0.15	0	0	0	0	0	0	0	
100	0	0	0	0	0	0	0	0.3	
200	0	0	0	0.2	0	0	0	0	
	50	50	50	50	50	50	50	50	EV

For example, for lane L4, there is a 70% chance the payoff chosen is 10 units, a 10% chance it is 30 units, and a 20% chance it is 200 units. The expected value for lane 4 is therefore $0.7 \times 10 + 0.1 \times 30 + 0.2 \times 200 = 50$ units, as required.

It should be apparent that the average bonus payoff value for each lane 230 is 50 units. However, the weights and associated possible bonus payoffs for each lane can be very different from each other. Furthermore, not all payoffs need to be possible for each lane, and vice-versa.

Several examples will illustrate the operation of Table I. In the first example, assume that the controller (as will be discussed subsequently) selects the following payoff values for L1 – L8 of Figure 2: {90, 50, 70, 200, 70, 80, 60, 100} which is shown in Figure 2. In this first example, the controller has selected the highest bonus payoff combination for each lane which is possible under this method. It is

also possible, under this method and as a second example, that the lowest combination of values could be selected and displayed in L1 – L8: {10, 50, 30, 10, 30, 30, 40, 20}. The second example represents the lowest payoffs that can be selected for each lane. Of course, any random combination of payoffs 260 based upon the percentage weights per lane could be selected by the controller from the payoff values in Table I. It is noted that for lane L2 in Table I, the payoff value of 50 is always selected. Under the teachings of the present invention any set of payoffs are possible such that Formula I is satisfied.

Further, to add even more randomness, the lanes L1 – L8 can be rotated from game to game (i.e., the weights for lane 1 may be applied to lane 2 in the next game, and so forth). The fixed value of 50 for lane L3 in Table I would be the value for lane L4 for the next game, for lane L5 etc. Or, the mapping from Table I for each successive game to actual lanes 230 may be done in a random fashion. The fixed value of 50 for lane L3 in Table I would be the value for a randomly selected lane such as lane L7 for the next game.

Note, too, that this algorithm does not require that *each* expected payoff, on a per-game basis, is always exactly D units. This volatility is a further advantage of this approach. For a third example, the lane-payoff values are randomly chosen to be: {80, 50, 50, 200, 30, 40, 60, 30} for lanes L1 through L8, respectively. The probability of this occurring is 0.00012, and the expected value for the bonus game 30 is greater than 50 units. However, in the long run, the payoff will average D units.

Table I represents an illustration showing how bonus payoff values 260 are randomly selected from bonus game to bonus game. Many other values of combinations are possible which fall within the teachings of the present invention. D may be any suitable value, the number of lanes L are a design choice, and the actual payoff values can be tailored to the casino's requirements. A low value of D, such

as $D \leq 5$, would generate little excitement in playing the Pachinko bonus game 30, while a high value of D, such as $D \geq 100$, would generate higher excitement. Also of consideration is how frequently the bonus symbol(s) 26 stop at the payline 22. The more frequent, then a lower D may be desirable. The lower the frequency, then a higher D may be desirable.

Method 2: An alternate approach which yields the same expected value EV each game is to randomly select a set of bonus payoff values 260 whose average value is D, and then assign each element of this set randomly to a lane 230.

For example, consider the set of lane payoffs L1 – L8: {20, 20, 30, 40, 40, 50, 100, 100} with an average value D = 50. Each of these payoff values 260 are randomly mapped to a lane in a one-to-one fashion, thus ensuring a game of value D. No equipment bias affects the expected value of the game, through the random assignment of values to lanes. In choosing different sets of lane payoffs, the volatility of playing the bonus game 30 may be increased or decreased.

A modified form of Methods 1 and 2 is to tie into the temporal approach of Algorithm 2 by randomly varying the lane value 260 as a function of time, with frequency governed such that the time-averaged value is D (e.g., by Table 1 above). This can be done by, e.g., fixing the time of a reward at T_D and selecting based on weight w, or fixing the selection as the same for all and selecting the period proportionate to weight. Other manifestations are possible. Provided that the period (time between changing values) is shorter than the typical cycle time for a ball to drop through a lane, but long enough for a player to recognize the present lane value, the game should provide considerable excitement.

Under the teachings of the present invention, instead of credits, prizes or other types of awards may be provided.

Lane Multiplier(s) Algorithm

In addition to the algorithms described above, additional lanes are provided elsewhere on the playing field 200 in an alternate embodiment. Such rows could be added above or below lanes L1 – L8.

Consider the embodiment shown in Figure 3 in which an additional row 300 of lanes L9 – L16, positioned midway through the playing field 200, is utilized as a multiplier (i.e., M = 1X, 2X, 3X, ...). The "X" symbol is used in the following as a "multiply sign." This row contains eight lanes also, each mapped in a random fashion to the set {1X, 1X, 1X, 1X, 1X, 2X, 2X, 3X} for lanes L9 – L16. The multiplier value 260M is displayed in flush mounted displays 250M so that a player may easily view the multipliers assigned to that lane. Each new game results in randomly selected values for M for each lane. Then the average value of the multiplier M is 1.5X. This can be multiplied by the value of D for the lower lanes L1 – L8 to determine the EV for the game as a whole. To wit,

$$EV = M \times D \qquad \text{FORMULA 3}$$

Alternately, the values for the multipliers may be chosen in a fashion similar to that described in Method 1 above.

It is to be expressly understood in this embodiment, that any number of lanes in row 300 could be utilized to provide the multiplication. Furthermore, one or more of the lanes L9 – L16 could be a "lose" lane (i.e., OX) so that when the ball 220 falls through that lane, the player loses; in which case when the ball 220 continues to fall and travel through on lanes L1 – L8, the payoff value is not recorded. Indeed, passing through a lose lane, in one embodiment, would instantly cause the displays 250 to display "zero" and there could be a multimedia display informing the player and others of the lose. The location and number of the additional lanes L9 – L16 is a design choice and they vary in number and can be placed anywhere

in the playing field 200 above or below the pay lanes L1 – L8. They do not have to be aligned in a row and can be dispersed on the field 200. Indeed, in some designs the ball 220 may enter a first multiplier lane (e.g., 2X) and then a second multiplier lane (e.g., 3X) before entering a payoff lane (e.g., $10 – in which case the player receives 2 x 3 x $10 = $60). The number of lanes, the position of the lanes, and the number of rows are simply a design choice and do not depart from the teachings of the present invention.

Lane Addition Algorithm

The row 300 in another embodiment could be additive, subtractive, or both. For example, lanes L9 – L16 could be {1+, 1+, 1+, 1+, 1+, 2+, 2+, 3+} mapped in a random fashion where the average addition is A = 1.5+. In another example, lanes L9 – L16 could be {1+, 1+, 1-, 1-, 2+, 2-, 3+, 3-} mapped in a random fashion where the average addition is A = 0.

Double-or-Nothing Algorithm

In another embodiment, the player may replay the Pachinko bonus game as follows.

The player is given the option to double-or-nothing the bonus payoff just received such as by re-pushing a button 28 in Figure 1. Should the player decide to risk the winnings from the prior Pachinko bonus game, the Pachinko lanes L1 – L8 would then be displayed in meters 24 with either a "Double" or "Nothing" symbol. By randomly assigning four "Double" symbols and four "Nothing" symbols to the bottom eight lanes L1 – L8 prior to re-propelling of the ball 220, the chances are 50/50 for success/failure each game. As before, this will be true despite any lane bias that may be present in the equipment.

Other variations in this embodiment include triple, quadruple, etc., or nothing. For example, lanes L1 – L8 could have the set {0X,

0X, 0X, 0X, 0X, 2X, 2X, 4X} randomly mapped to it resulting in an average multiplier of M=1.

Payoff Display Sequence

The displays 250 operate in several different sequences under the teachings of the present invention. In a first display sequence, the displays 250 for all lanes simultaneously display the payoff values 260. In a second display sequence, the displays 250 operate to randomly flicker payoff values 260 at different staggered times so that while a display in one lane is present, a display in another lane is just being displayed, etc. In a third display sequence, the time that a particular payoff value 260 is displayed in a lane 230 is proportional to the payoff weight so that a two hundred dollar payoff would have a shorter display time and a ten dollar payoff would have a faster display time.

Stand-alone Pachinko Game

The algorithms of the present invention can also be employed if the Pachinko game is a stand-alone machine. In this case, however, some of the payoff values are net losers based on coin-in. To encourage variety in the lane payoff values, and to allow for a variety of house advantages, Method 1 coupled with either Algorithm No. 2 or Algorithm No. 3 is preferred in this case.

Consider a stand-alone five-coin Pachinko game with a desired 10% house advantage. Assume the multiplier value is fixed at M = 1X. To obtain a payoff value of D = 4.5, the following is an example:

Table II

	Weights								
Payoff	**L1**	**L2**	**L3**	**L4**	**L5**	**L6**	**L7**	**L8**	
0	0.2	0.2	0	0.855	0.955	0.55	0	0.5	
1	0.2	0	0	0	0	0	0	0	
2	0.1	0	0	0	0	0	0	0	
3	0.1	0	0	0	0	0	0.1	0	
4	0.2	0.5	0.5	0	0	0	0.3	0	
5	0.1	0.1	0.5	0	0	0	0.6	0.1	
10	0	0.2	0	0.1	0	0.45	0	0.4	
25	0.1	0	0	0.04	0	0	0	0	
100	0	0	0	0	0.045	0	0	0	
500	0	0	0	0.005	0	0	0	0	
	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	EV

As before, the value for each lane 230 is chosen randomly by a controller and displayed in displays 250, with weights according to Table II above. In so doing, any equipment bias in the stand-alone Pachinko game is nullified with respect to house advantage. In the example above, lane 5 will have a value of 100 coins 4.5% of the time. A 500-coin payoff in lane 4 will appear once every 200 games.

These payoffs are merely exemplary and can, of course, be modified to the particular design. Table II does demonstrate, however, the mechanism whereby large "jackpot" values will periodically appear as possible payoffs and wherein the payoff values 260 in displays 250 are randomly changed from game to game.

These large jackpots can also arise from the use of multiple rows of lanes possibly including multipliers, additions, etc.

Bonus Game Hardware Configuration

Figure 4 sets forth the details of the interconnection between the slot machine 20 and the Pachinko bonus game 30 of the present invention. The slot machine 20, as mentioned, may be any one of a large number of different slot machines from a wide variety of manufacturers. Modern slot machines 20 typically have reels 40A, 40B, and 40C which may be mechanical or electronic. However, any number of reels could be used. For example, the slot machine 20 may be played on a CRT screen. The design and operation of a slot machine 20 are well known. Under the teachings of the present invention, as shown in Figure 1, a special symbol or symbols 26 is added to the control software for the slot machine controller 400 and to the reels 40A, 40B, and 40C. As discussed, the present invention is not limited to this one approach to "initiation" of the bonus game 30. The controller 400 is conventionally a microprocessor-based computer. When the special symbol or symbols 26 appears on the payline 22 of reels 40A, 40B, and 40C, as functionally represented by line 402, the controller 400 pauses or deactivates the slot machine game and delivers a communication over line 404 to a communication port 410 for delivery over lines 412 to a communication port 420 in Pachinko bonus game 30. This communication over lines 412 is an activation signal to activate the Pachinko bonus game 30. The Pachinko game controller 430 upon receipt of the activation signal initiates over lines 432 a multimedia display 440 on or near the Pachinko bonus game 30 which may be comprised of sounds (such as words and/or music), signage (such as a digital display announcing a bonus game), or graphics (such as a moving ball). The use of a multimedia display 440 is optional under the teachings of the present invention but is preferred and may encompass any of a wide variety of multimedia presentations.

The Pachinko game controller 430, in response to the activation signal received on lines 422 and the activation of button 28

by the player enables the launch ball mechanism 450 over line 434 to launch the ball 220 onto the field 200. Under alternate embodiments, the launch ball mechanism may be mechanically activated by a player such as by conventionally pulling back on a pull rod which is then released to propel the ball up chute 280 and into the playing field 200. Or, in other embodiments, a mechanical ball launcher 450 is used and if the player does not launch the ball within a predetermined time period, such as five seconds, the Pachinko game controller 430 automatically launches the ball. The Pachinko game controller 430, in response to the activation signal over lines 422, selects a set of payoff values 260 for delivery over lines 436 into the displays 250. Several approaches for determining what payoff values 260 are to be displayed have been discussed above. The Pachinko game controller 430 is suitably programmed and works with a random number generator 460 which may be a separate chip or software embedded in the Pachinko game controller 430 to randomly select payoff values from a table in memory 480 over lines 482 such as set forth in Table I.

After the ball 220 is propelled by the launch ball mechanism 450, the ball, after a period of time, travels through one lane 230. In Figure 4, the ball 220 is shown passing through lane L2. Each lane 230 has a sensor 470 which senses the presence of the ball 220. For example, for a nylon ball 220, a suitable sensor is an infrared sensor or a diode switch flush mounted to field 200. The sensor 470 issues a signal on lines 472 back to the Pachinko game controller 430. In the preferred embodiment, each sensor 470 has an individual line 472 to the Pachinko game controller 430. Hence, the Pachinko game controller 430 knows which lane the ball 220 has fallen through and, therefore, the Pachinko game controller 430 knows which payoff value (in the example of Figure 4, $50 or fifty coins) is to be awarded the player. The same type of hardware could be used to sense the presence of the ball 220 in a special change value area (such as area 300) with sensors 302 also connected to controller 430. The Pachinko

game controller 430 then communicates with slot machine controller 400 through the communication ports 410 and 420 with the payout value 260 information so that the slot machine controller 400 can increment the credit meter 24 in the slot machine 20 with the payoff value 260 (for example $50).

It is to be expressly understood that a number of different designs could be implemented under the teachings of the present invention. For example, one skilled in the art could remove the random number generator 460 and the Pachinko game controller 430 as well as the communication ports 410 and 420, and have the connections 436, 472, 432, and 434 delivered directly into and under control of the slot machine controller 400.

The field 200 may have any number of recessed lights, lighted designs, and/or sound effects commonly found in Pachinko and pinball games which are not shown and which are controlled by Pachinko game controller 430.

Operation

In Figure 5, operation of the present invention is set forth. In reference to Figure 4, the slot machine 20 is conventionally played in stage 500. When a bonus symbol 26 appears on payline 22 in stage 510 (or other "initiation"), the controller 400 sends an activation signal to Pachinko game controller 430. Stage 520 is then entered. The Pachinko game controller 430, as discussed, selects random payoffs 260 in stage 530 based upon the random number generator 460 and the payoff table stored in memory 480 and in stage 540 displays them in displays 250. In stage 550, the bonus game is activated with the Pachinko game controller 430 activating launch ball mechanism 450.

It is to be expressly understood that the order of stages 530, 540, and 550 can vary based upon method and the algorithm being used as discussed above as well as other design considerations. For example, if Algorithm No. 2 is used for a simultaneous display, and is

based upon a two-second repetitive cycle, then every two seconds stage 530 selects new random payoffs for simultaneous display in stage 540. This continuously occurs until the bonus game play is over with. In the preferred embodiment of Algorithm No. 3, Method 1, the Pachinko game controller 430, at any time after being activated in stage 520 and before play is done in stage 560, can select a random payoff value for display. However, in the preferred operation of Algorithm No. 3, Method 1, sometime after activation in stage 520, the random values 260 are selected in stage 530 for display in stage 540. The launch ball mechanism 450 is then activated in stage 550 and play is done when the ball 220, as shown in Figure 4, is sensed by one of the sensors 470. If too much time elapses, and the ball 220 is not sensed after launch, an error stage 570 may be entered. When the ball 220 is sensed in a lane 230 in stage 560, then in stage 580, the Pachinko game controller 430 determines the value of the payoff assigned for the lane, delivers that information to controller 400 which then increments the credit meter 24 in stage 590. In stage 592, the Pachinko game controller 430 may cause a multimedia display 440 to occur based upon the win received by the player. After which, play is resumed at the slot machine 20 in stage 500 and the process repeats.

Stand-alone Pachinko Game

In Figure 6 and 7, the details of the stand-alone Pachinko game 30 is shown. Where possible, like numbers are utilized which refer to earlier discussed structure and functions.

In Figure 6, the hardware configuration for the stand-alone Pachinko game 30 is shown. This corresponds to the hardware configuration for the Pachinko bonus game shown in Figure 6. However, an activation circuit 600 is shown which activates the controller 430 in the manner discussed above. In all other aspects, the hardware configuration for the stand-alone Pachinko game 30 of Figure 6 corresponds to the discussion of Figure 4 for the Pachinko

bonus game. However, the activation circuit 600 constitutes any suitable activation conventionally used for a casino game such as receiving monetary value in the form of a wager (bill acceptor, coin in, etc.) and an activation signal from the player such as a start button, pulling of a handle, touching of an icon on a screen, etc. In addition, a credit meter 610 is provided in the stand-alone Pachinko game as shown by display 610 which directly communicates with the controller 430 over lines 612. In the event the player wins, the credits 610 are appropriately incremented. In the case a player loses, the credits 610 are appropriately decremented.

Likewise, in Figure 7, the functional flow chart of the stand-alone Pachinko game 30 is set forth. This corresponds substantially to Figure 5. Here when the payoff occurs in stage 580, the credit meter 610 of Figure 6 is appropriately incremented or decremented.

Payoff Dispensing Mechanism

In yet another alternate approach to the teachings of the present invention, Pachinko game 30 of the present invention can utilize as a payoff dispensing mechanism. Formula 1 sets forth an overall payoff value of D as the expected value, EV.

It is well known in conventional game play for an underlying casino machine 20, that payoffs are commonly given. These payoffs are typically shown as printed charts actually on the machine. For example, in the case of the slot machine 20 and three double bars, the payoff printed on the chart may be twenty dollars. A player receiving a winning combination for the underlying casino gaming machine 20 is assured of receiving the printed payoff value. Under the teachings of the present invention, whenever a winning combination is obtained by a player at the underlying gaming machine 20, the Pachinko game 30 automatically is activated to allow the player the opportunity to receive more or less than the printed payoff value. In other words, the Pachinko bonus game of the present invention acts as a payoff-

dispensing machine. From the casino operator's point of view, under Formula 1, the casino still pays the printed payout values. However, from the viewpoint of the player, a significant and additional level of excitement and further game play is present in watching the Pachinko game operate to dispense payoff which may be more or less than the stated printed payoffs. In some embodiments of this modification of the present invention, a player may have the option to take the printed payoff value or to play automatically for the higher or lower value.

Fixed Payoff Embodiment

The disclosed Pachinko bonus game and/or the stand-alone Pachinko game discussed above, in this embodiment, provides fixed payoff values 260 for lanes L1 – L8 which could be printed at each lane or displayed in displays 250. Hence, the payoff values remain the same from game-to-game. Of course, this embodiment is subject to mechanical bias.

Bonus Game with Themed Play

A bonus feature utilizing the Pachinko top-box 30 themed to a casino game, such as the well known BATTLESHIP game from Hasbro as shown in Figure 8 is illustrated herein. A casino version of the BATTLESHIP game is found in U.S. Patent Nos. 6,398,644 and 6,645,071 incorporated herein by reference. Any suitable theme could be utilized. In the BATTLESHIP game, ships are targets to be hit or to be missed. Any other suitable target or object to be avoided can be utilized under the teachings of the present invention based upon any suitable theme. As an example of the latter, avoiding hitting an object, such as a tree, during play of the game results in an award.

The bonus display 800 can be a video screen display (or any suitable display whether electronic or mechanical) mounted behind or below the field 200 so that the ball 220 can travel over or up to the edge of the screen. The dividers 240 can physically extend all the

way down to the bottom over the video display 800 (or only partially). Alternatively, the dividers 240 can be adjacent to the video display 800. The video display 80 can have etched or painted on lines 810 to simulate the continuation of the physical division of dividers 240 or can be graphically shown as part of the video presentation. In the situation where the display 800 is a video display, the targets T (T1-T3) such as ships 802, 804, 806 can be stationary at a lane L (L1-L8). Or, the targets T can have moving effects such as caused by wave action from water. Or, the targets T can actually be moving across the lanes L in the bonus display 800. Note furthermore that each target T may occupy one lane or more than one lane. In one embodiment, a target occupying more than one lane occupies a plurality of adjacent lanes, such as a boat whose length occupies, e.g., three lanes. Furthermore, when the ball 220 "hits" a target as shown by arrow 820, a game response indication 830 such as a visual effect and/or other suitable display such as an exploding noise and an explosion visually shown on display 800 can occur to add more excitement to the game. In other embodiments, the display 800 can be any suitable mechanical or electrical/mechanical display that displays the target T in a stationary fashion or in a moving fashion.

Bonus game play is initiated through a qualification condition in the underlying casino game machine game 20. A large number of conventional conditions can occur such as a bonus trigger symbol appearing. The top box 30 includes the Pachinko playfield 200 with a display 800 that indicates whether each lane 230 is empty or whether it has a "target" T such as an enemy ship 802, 804, 806 located therein. The object of the game in Figure 8 is to drop the ball 220 from an opening 840 and have it "hit" a target T such as an enemy ship 802, 804, 806 by passing through a lane 230 having an enemy ship. If instead the ball 220 drops through an empty lane (such as lane L5 in Figure 8) this is a "miss." The hole 840 is sized to allow the

ball 220 to pass through. Behind the field 200 is a vertical "escalator" (tube) of balls driven by a mechanical motion, not shown.

In Figure 8, ship 802 occupies lanes L1 and L2, ship 804 occupies lanes L3 and L4, lane 5 is empty and ship 806 occupies lanes L6, L7, and L8. Hence, when ball 220 travels through lane 5 it travels through an empty lane and this is a miss. However, if ball 220 travels through lane 8, ship 806 is hit. If ball 220 travels through lane 3, ship 804 is hit and if ball 220 travels through lane L2 ship 802 is hit. With each successive hit (or stage of play), the top-box lighting and background audio/visual effects will "heighten" in intensity and frequency to increase suspense.

As the bonus game of Figure 8 initiates, the display 800 indicates an enemy ship (802, 804, 806) at lanes L. In one embodiment, the first "shot" (ball 220 dropped) will always be a hit (as a ship is always at a lane) and serves to provide the player with a minimum bonus level or award. In another embodiment, one or more lanes are empty as shown in Figure 8.

After each hit, the video screen 40 (on the base game 20) changes to display a set of "objects" 900 based on the "stage" of battle as shown in Figure 9. For example, for "Stage 1 Complete" the player might choose from "objects" 900 such as seashells, while other stages might display starfish, coconuts, palm trees, etc. The player-is prompted to choose an object 900 which then reveals a hidden award 910. The awards are shown in dotted lines in Figure 9. Thereafter, (for the next stage of the bonus game) the hit ship (802, 804, 806) is removed (extinguished in the top box display 800), and the remaining ships are shuffled (randomly, in one embodiment or orderly, in another embodiment) and reassigned to be at lanes L prior to the next "shot." Alternatively, the player might "advance" to the next battle scenario and a new set of ships might be assigned to lanes L prior to the next "shot." The bonus game of Figures 8 and 9 ends when the player's shot is a miss (e.g., the ball traverses a lane that is empty).

It is an advantage that the player generally takes multiple shots during the bonus game, each hit resulting in the next stage of bonus play. Too, as the potential awards for each Stage grow, and yet the chance of success slowly diminishes, the suspense also grows for the player with each successful shot.

The following average pay schedule is exemplary for 8 stages of play:

Hit #	Award
1st	25x
2nd	10x
3rd	20x
4th	40x
5th	60x
6th	80x
7th	125x
8th	500x

Based on a Monte Carlo simulation of the bonus game, the following is obtained:

EV (Expected Value) = 85.3

Average number of shots = 4.25

For example, if a "starfish" object is selected, the selected starfish value would have an average value of 25x for the first hit (e.g., {15x, 20x, 25x, 30x,35x}, an average value of 10x for the second hit (e.g., {5x, 10x, 10x, 10x, 15x}, etc. As an alternative, ships may be portrayed some of which are the enemy (to be hit), some of which are friendly (to be avoided). The status of lanes may be such that four lanes are enemy occupied, three lanes are friendly, and three lanes are vacant. "Shooting" a friendly ship (i.e., "end-of-game" target in at least one lane) ends the bonus game, "shooting" an enemy ship (i.e., a target) yields an award, and "shooting" an empty lane results in another shot being awarded.

To avoid any physical bias that may be introduced into the equipment, the ships and vacant lanes are randomly positioned in one embodiment such that each lane has an equal likelihood of containing

a ship or being vacant. For example, consider a casino game with 10 lanes L, one of which is to be vacant and nine of which are to have a "ship" occupy the lane. To preserve fairness to the house and to the player even in the case of mechanical bias in the Pachinko equipment, the placing algorithm should be such that each of the 10 lanes is equally likely to be vacant (and hence, each of the 10 lanes is equally likely to have a ship). In practice, this may be done by first randomly choosing which lane shall be vacant (say, lane L4), and then subsequently "filling in" the other lanes with ships of varying sizes (e.g., a ship filling in three lanes, a ship filling in two lanes, and a ship filling in four lanes).

As an alternative, to add suspense, prior to each shot, one of the remaining ships may be selected to randomly display a special effect such as blinking, being lit, having a value, etc. Should this ship be sunk, the resultant award may be increased, for example, tripled.

The method steps implementing the bonus game described above in software are shown in Figure 10. The bonus game starts in any conventional fashion from the base game 20 in step 1000. The Pachinko bonus game of Figures 8 and 9 is then enabled for play at 1010. Play of the Pachinko bonus game can occur either through the player launching the ball 220 or an automatic launch with or without multimedia effects. The "target(s)" T are displayed in display 800 in step 1020. The ball 220 is launched and travels through the playing field 200 as described above and passes through one of the lanes L to hit (or miss) a target T such as a ship 802, 804, or 806. The detection of a hit occurs in step 1030 and is computer determined in one of any number of different ways. For example, the sensors (discussed above) can be utilized to sense which lane L the ball passes through, and the computer, in software, determines which segment of the display 800 corresponds to the traveled through lane so that the computer can determine whether or not a hit has occurred on a target T. If there is no hit in step 1030 then the bonus game ends in step

1040. As mentioned above, and in one embodiment, when the target(s) are displayed at 1020, for the initial launch of ball 220, a target T occupies each lane, thereby assuring a hit 1030. In this embodiment, a hit on a target T occurs at step 1030, the bonus game continues, and a corresponding visual indication 830 is given at step 1050 which can be any suitable audio/visual effect and, if paid, any suitable award such as set forth above in the payout table. If an end-of-game hit on a friendly target is determined 1030, then the bonus game ends 1040. If the ball travels through a lane with no target, then in one embodiment a new ball is propelled in step 1070 and in other embodiments the game ends 1040. The method is vigorous and the many design methods taught herein can be implemented.

In one embodiment, bonus game play continues so that step 1060 is entered to display a set of objects 900 in the base game display 40 as shown in Figure 9. Here, the player is afforded the opportunity to select in stage 1070 by touching (or other input) one of the displayed objects 900 so that it can reveal an additional award for the next stage play. This continued interaction of the player with the base game display 40 is optional.

The "next stage" is entered at step 1070, and play of the Pachinko bonus game 1010 continues with new targets T 1020 displayed. As mentioned above, and in one embodiment, the target T hit in the prior play is removed from the remaining targets T and the remaining targets are randomly shuffled and displayed across the lanes L. In this embodiment, with a target T removed, more lanes are empty, thereby increasing the possibility that play will end at step 1040 with a miss when the ball travels through an empty lane L. In another embodiment, the same targets T are randomly shuffled and displayed. In another embodiment, entirely different targets T are displayed in each new stage with or without the same number of targets for each next stage. It can be appreciated that the game is vigorous at this point with many possible embodiments. Play continues according to

Figure 10, until the ball 220 travels through a lane L that is empty and the game ends at 1040. The sequence of "hits" might lead to a jackpot award if there are no misses. Or, it might lead to a progressive award, etc.

In another embodiment of the present invention, more than one ball 220 can be launched either sequentially or simultaneously so as to provide for more possible hits in a single play of the Pachinko bonus casino game disclosed herein.

The playing field 200 can be any playing field and is not limited to the type shown in Figure 8. Any conventional playing field or future playing field can be utilized with the lanes L to display in display 800 at least one target T. According to the teachings of the present invention, this display 800 provides the opportunity to add further excitement to the play of the ball on a playing field wherein the ball would exit through a plurality of lanes to either hit a target or to miss a target according to the discussion contained herein.

The term "underlying casino game machine" shall be any mechanical, electronic, or video slot machine, any casino base game whether or not a slot machine, etc. The definition is vigorous and is not meant to limit the invention to past, present, or future gaming machines.

The terms "hit" and "miss" are used to mean the presence (or non-presence) of a target T at the lane the ball 220 travels through. The ball 220, of course, does not literally hit a target, but the correspondence of the ball and the target "at" the same lane L by the computer constitutes a "hit" to the player which results in the award of a payout. The term "at" used above means above the lanes L, in the lanes L, behind the lanes L, near the lanes L, or below the lanes L.

Furthermore, the bonus game disclosure herein can be adopted for a stand-alone Pachinko game as fully discussed earlier in this application. Such a stand-alone Pachinko casino game would be initiated upon placing a wager (rather than being initiated upon the

occurrence of a bonus condition). In this embodiment, the targets T are randomly displayed and disposed at a plurality of lanes L wherein more lanes are empty (i.e., not having an associated target present when the ball travels through a lane) so as to obtain more misses.

It is to be expressly understood that Figure 8 shows targets T that are at more than one lane. Targets T can be utilized under the teachings of the present invention that are at only one lane.

The above disclosure can be implemented in a wide area progressive. As an example, with a playing field having a row of eight lanes, the probability of sinking all eight ships is 0.0024 (approximately 1 in 416) for eight successive shots. As such, with a base symbol probability of 0.0000416 (approximately 1 in 24,033), the overall probability of winning the wide area progressive is set to approximately 1 in 10,000,000 utilizing a dual-stage qualification (1/416 x 1/24033). This gives players more of a "taste" of almost winning compared to traditional wide area progressives. Each ship occupies only one lane. The casino bonus described in this example has up to eight "shots" (i.e., eight separate launches of a ball). The first shot is with 8 ships (hence a sure hit). The next shot is with seven randomly placed ships, then 6, 5, 4, 3, 2, and finally 1 ship. In each case, the lanes with ships/vacant are randomly assigned.

BONUS GAME WITH MATHEMATICAL COMPUTATION

In another embodiment shown in Figures 11 and 12, the casino bonus game plays as follows. Upon the initiation of a bonus condition, as previously discussed, the player receives a predetermined number of balls which are propelled onto the playing field 200. In Figure 11, three balls are shown, B1, B2 and B3. The display 800 randomly displays a series of numbers when a player of the bonus game begins. In this embodiment, there are ten lanes L1 through L10 and a series 1100 of random numbers from zero through nine corresponding to the single digits of the decimal system are displayed in the ten lanes. In this example, ball B1 is launched first and goes through lane L4 in which the number six is randomly displayed for the "units" decimal placement. Then ball B2 passes through lane L9 in which the number one is randomly displayed for the "tens" decimal placement. Finally, ball B3 is delivered through lane L1 corresponding to the random number zero for the "hundreds" decimal placement. The sequence of ball activation results in a decimal number of "016." Hence, the award to be given the player is a function of the number "016." For example, if the player had wagered two units as a bet to play the underlying casino base game, then the award in the bonus game would be 32 units as "016" is used as a multiplier. In a multi-line game, the initiating line bet may be considered the bet. In another variation, the decimal number "016" could be the actual award in units.

Indeed, under the teachings of this embodiment, more balls such as the optional ball B4 could also be delivered to provide the "thousands" decimal placement, etc. The game response indication for this win is shown as 1110 and can be used to increment a credit meter or the like.

In another embodiment, the three balls generate three numbers (e.g., 1, 4 and 6), and the player is awarded the maximum number thereby created (e.g., 641) multiplied by an initiating bet (or 641 units are awarded).

In Figure 12, the method of the present invention for the aforesaid embodiment is set forth. The bonus game starts 1200 with a suitable bonus initiate condition such as a trigger from the base game. The bonus game is then played in stage 1210. Here, the single digit series 1100 of numbers are randomly displayed at each of the ten lanes L1 through L10 which is shown in stage 1220 to the player. The ball is launched, as discussed, and this can occur at any suitable time. In stage 1230, the ball is sent traveling through one of the lanes and an internal ball counter is incremented in the computer control. Hardware and software counters are well known in the computer arts. The next sequential ball 1250 is delivered and the display 1220 displays the prior randomly assigned numbers. In another variation of this embodiment, a new set of digits could actually be randomly displayed. In stage 1230, the counter is incremented by one and the process described above repeats until no balls are left. When that occurs, stage 1260 is entered which provides the game response indication 1110. It is to be expressly understood that the game response indication 1260 can be shown incrementing with each passing ball in stage 1230. It should be noted that the indicator 1110 may be a common display for the base game, with an alternative depiction when in bonus mode. In this example, when the pre-determined number of balls have fully been launched and travel through lanes, the game response indication is a number such as "016" read discussed above. An award 1270 is provided based on the indication 1260 such as the number read or the maximum number based on the number read. The bonus game is now ended in stage 1280.

In another embodiment of Figures 11 and 12, one or more of the lanes have indicators which offer different meanings. For example, the third ball B3 dropped may include, within one of the lanes, a symbol depiction of a star which provides a "zero" number, but enables another ball launch. If the ball B3 drops into the star lane,

then the hundreds digit becomes a zero, and a fourth ball B4 is dropped to depict the thousands digit. In this manner, the player enhances his/her win if the star lane is selected. With reference to Figure 11, the star 1130 is shown in lane L1. This embodiment provides an award of B1=6, B2=1, B3=0 (enables ball B4), and B4=2. The award is 2016. In another embodiment, selection of a "2x" lane by any of the balls automatically doubles the total win amount. For example in Figure 11, if ball B1 hits L4 and a "six" is read. Then ball B2 hits L9 an a "one" is read. Then ball B3 hits L1 with the 2x symbol 1140, and a "zero" is read, but the final award is doubled. So, the number read is "016" and the award is doubled to 32. Any suitable graphic symbol could be provided other than a "star" or "2x" to perform an added game feature on the read number such as a new ball launch, a mathematical operation such as 2x, etc. As shown in Figure 12, the added game feature 1262 is implemented under computer control to detect the presence of any displayed graphic symbols in a lane that a ball travels through.

In yet another embodiment shown in Figure 13, particularly suited to the embodiment in which numerical award values 1300 are depicted in each lane, one or more lanes act as "sweeps". For example, one of the lanes (lane L4 in Figure 13) could have a "left arrow" picture 1310. If the ball B1 drops into this lane L4, the player would win the computed sum of all values to the left of this lane. The total in this example is 18 and this is shown in the indication 1320.

Another lane might have a "bomb" picture 1410 as shown in Figure 14. If the ball B1 drops into this lane L4, the bomb graphically explodes 1420, giving the player an award computed with the values affected by the explosion 1420. In Figure 14, the computation could be the sum of L2=4, L3=8, L5=9, L6=5 or "26" which is displayed indication 1430. The computation could be multiplication in which case 4x8x9x5 is awarded. In each case, a ball falling into one of the lanes causes a suite of values to be involved in the computation and

be awarded to the player. The explosion 1420 could be some or all values 1400.

In the above two examples of a directional arrow 1310 and bomb 1410, a graphic is displayed in one (or more) of the lanes L and if the graphic is hit by the ball, a predetermined mathematical operation based on the graphic occurs. In the case of Figure 13, the mathematical operation is the summation of the numerical values displayed to the left of the arrow 1310. In the case of a bomb in Figure 14, a topological area 1420 is displayed in which the values are summed. Various mathematical operations may be performed on the values within area 1420, including summation, multiplication, and/or other mathematical operations. Any suitable graphic could be utilized under the teachings of the present invention.

In still another embodiment shown in Figure 15, particularly suited to the embodiment in which numerical award values 1500 are depicted in each lane, one or more lanes have a multiplier designation of a set amount (e.g., x3 in L4). Should the ball B1 land in the multiplier lane, values in each remaining lane are tripled. When a ball B2 is then dropped through lane L4 having a value of 4, the player's award is computed to be 3x4 or 12 (again, the "12" could be used as a multiplier of a bet or the award of units).

While the embodiments of Figures 8-15 show features of a casino bonus game, it is to be expressly understood that these game features could be implemented into a stand alone casino game, a casino game played over the internet, or a scratch lottery type of game.

The latter is shown in Figures 16 and 17 but could be utilized throughout the disclosure above. For example, in Figure 16, a graphic arrow 1600 is hidden below a scratch play area 1610 of a scratch lottery ticket 1620. Each of the five play areas 1630, 1632, 1634, 1636, 1638 are covered with conventional material that can be scratched by a player to reveal a hidden symbol 1600 (i.e., arrow) or

1640 (i.e., X). Underneath each scratch play area is a corresponding scratch award area 1631, 1633, 1635, 1637, and 1639. Each scratch award area has a value 1650 (usually in dollars). In the play of the scratch lottery game of Figure 16, the player can only scratch one of the play areas 1630, 1632, 1634, 1636, and 1638. Scratching more than one play area 1610 would invalidate the ticket 1620. If the player scratches a scratch play area that does not contain the arrow 1600, the game is over as the player will reveal a symbol such as "X" 1640. On the other hand, if the player scratches a play area such as 1634 to reveal the directional symbol such as arrow 1600 then the player would win the value in the scratch award area 1633 under the arrow ($2.00 at 1633) plus the awards under areas 1631 and 1632 ($3.00 at 1631 and $5.00 at 1632) which would be also revealed by scratching. Hence the player wins $10.00.

Figure 17 shows the implementation of the directional symbol being a bomb graphic 1700 into a lottery ticket 1710. Scratching any of the other play areas 1720 to reveal the "X" would result in no award. However if only the play area 1720 containing the bomb 1700 is scratched, then the player would scratch the award area 1730 directly under the bomb 1700 and the adjacent award areas on either side. In the example of Figure 17, the player would scratch 5, then 2, then 3 to win an award of $10.00. The area scratched is shown by 1740.

What is described above in Figures 16 and 17 is a scratch lottery ticket having a plurality of scratch play areas wherein one of the scratch play areas has a directional symbol such as arrow 1600 or bomb 1700. The directional symbol directs the player, based on information contained on the ticket, as to which scratch award areas are now to be scratched and uncovered. The award areas that are scratched pursuant to the instructions on the ticket pertaining to the directional symbol are then summed and awarded.

BONUS GAME INTERACTING WITH BASE GAME

The above embodiments of Figures 8-15 can also be implemented to affect the underlying casino game 20 such as a conventional multi-reel, multi-pay line video slot game. In the example of Figure 18, the ten lanes L1-L10 are used, but the lanes would match a corresponding number of vertical columns 1810 in the display 40 of the base game 20. When a bonus feature occurs in the casino game of Figure 18, the ball B1 is delivered and passes through a lane such as lane L4 and then is graphically shown to sweep all of the symbols in the corresponding column 1810 (L4). The timing is implemented by the computer control. When the ball B1 passes through lane L4, the screen column 1810 (L4) is caused to graphically show the ball B1 traveling through the column as shown by arrow 1830 and to convert all displayed game outcome symbols to a wild symbol W. The player then receives payouts for any winning combinations in the game outcome 1800 displayed with the column 1810 (L4) converted to wild symbols W. In one embodiment, the appearance of a graphic such as arrow 1310 (Figure 13) could cause all game outcome symbols in row 1820 to become wild. Likewise, if ball B1 passes through a lane that has a bomb symbol, game outcome symbols within a predetermined area on the video screen 1800 would become wild through an explosion symbol.

Figure 19 shows another variation of the Pachinko bonus game interacting with the display 40 of the underlying base game 20. In this embodiment, the ball B1 travels through lane 4. In the display 800 of the bonus game 30, at least one of the randomly displayed symbols S1-S10 appears in at least one of the lanes L1-L10. In the example of Figure 19, each lane has a different randomly displayed symbol. This embodiment is vigorous in that the lanes L1-L10 could be variously configured. In one variation, some of the lanes could have award values, and some of the lanes could have symbols. Or, in another

variation, only certain of the symbols used in the play of the underlying casino game appear in the lanes.

These symbols are the conventional symbols that may also be displayed in display 40 in the reel spin as a game outcome shown as 1900. The game outcome in the underlying casino game is based on these symbols. Some or all of these symbols may appear in the game outcome. This is a conventional game outcome, and the symbols S1-S10 are conventional and can comprise any desired symbol. The designations S1-S10 are only used to illustrate the embodiment of the present invention. The ball B1 travels through lane L4 which corresponds to a randomly displayed symbol S8. As soon as the ball B1 travels through lane L4, it is sensed, as discussed above. Then, all S8 symbols in the displayed game outcome 1900 are changed to a wild symbol W. Any payout to the player is based upon the game outcome with all S8 symbols converted to wild symbols. This adds excitement and increases the possible award based upon the game outcome 1900 with the converted wild symbols.

In Figure 20, the flow chart for the examples of Figures 18 and 19 providing base game interaction is shown. In Figure 20, the bonus game 30 is started 2000 as before. The ball B1 is propelled on to the playing field 200 among the pegs 210. The display stage 2020 is optional in Figure 18 but in Figure 19 the display stage 2020 randomly displays symbols S1-S10 (in the case of the above example). The display stage 2020 displays the symbol or symbols randomly in one, some, or all (i.e., at least one) of the lanes L1-L10. In stage 2030, a base game interaction determination is made. For example, in Figure 19, S8 is a displayed symbol in the game outcome shown in game outcome 1900. Hence visual effects 2040 now occur in the display game outcome 1900 by converting all symbols "S8" to a new wild symbol "W" (in the case of the example). In the event ball B1 goes through a lane containing a symbol that is not displayed in the game outcome 1900 (or in variations of this game, a lane not having a

symbol that interacts with the lower base game), then the game is over with in stage 2060. It is to be expressly understood that the ball may travel through a lane and thereby provide an award in which case the game ends 2060 with the award being given to the player. In the event the base game interaction is detected in stage 2030, stage 2040 is entered, and the visual effects occur as discussed. This could be the all symbols column 1810 (L4) in Figure 8 becoming wild W or any other suitable visual effect based upon the teachings contained herein. Stage 2050 is then entered to determine the award based upon the modified game outcome (1800 or 1900) with the converted wild symbols W. The game then ends at 2060.

In this embodiment, the Pachinko bonus game is used to generate wild symbols in the underlying casino game.

The various Pachinko bonus embodiments shown in Figures 8-15 and 18-20 are preferably contained within a single enclosure such as a separate mechanical top box 30 to electronic base game 20, as shown in the listed figures. The Pachinko bonus embodiment can also be incorporated into the screen 40 and played electronically with the Pachinko field and ball graphically shown.

SEAL CARD GAME AND METHOD

In Figures 21 and 22 are shown scratch lottery tickets according to a number of embodiments of the present invention. The following applies to pull tickets and to all types of seal card games.

In Figure 21, a directional symbol in the form of an arrow 100' is hidden below conventional removable material 110' of a scratch lottery ticket 120'. Each of the five scratch play areas 130', 132', 134', 136', 138' in the play region 170' is covered with the removable material 110' that can be scratched by a player to reveal a hidden symbol such as arrow 100' or an "X" 140'. Below each scratch play area is a corresponding scratch award area 131', 133', 135', 137', and 139' in an award area 180' also covered with removable material 110'. Each

scratch award area has a hidden value 150' (usually denominated in dollars). A set of instructions 160' are found on the ticket 120'.

In play of the scratch lottery game of Figure 21, the player can only scratch one of the play areas 130', 132', 134', 136', and 138' in play region 170'. Scratching more than one play area would invalidate (or void) the ticket 120'. If the player scratches a play area that does not contain the arrow 100', the game ends, as the player will have revealed an end-of-game symbol such as "X" 140'. The symbol "X" 140' could be a phrase such as "GAME OVER," a symbol such as a STOP SIGN, a blank, etc.

If the player scratches a play area such as 134' to reveal a directional symbol such as arrow 100' then the player would win the hidden value in the scratch award area 135' under the arrow ($2.00) as well as the hidden values under areas 131' and 133' ($3.00 at 131' and $5.00 at 133') which would be also revealed by scratching. Hence, in this example, the player wins $10.00. The directional symbol 100' authorizes the player to reveal the award areas of 131', 133' and 135' in a topological area 190', and to be awarded an amount of money corresponding to the sum of the values illustrated in the revealed award areas. Area 190' is shown including play area 134' and the award areas 131', 133', 135' corresponding thereto. However, it will be appreciated that other groupings of play areas and associated award areas are possible under the teachings of the present invention.

Under the teachings of the present invention, revealed values 150' could be monetary values, such as dollars, a multiplier or a divider (or any other mathematical operation), a free ticket, etc. The values can also be zero or negative. For example, in Figure 21, the authorized areas have an authorized award set of {$3.00, $5.00, $2.00} and the predetermined mathematical operation is summation, thereby resulting in an award of $10.00. In another example, assume the revealed value is the set of {$3.00, $5.00, 2X} which results in a

payment of $3.00 plus $5.00 equals $8.00 times two, or $16.00. In a variation, rather than having a set of values printed on the ticket, a phrase such as "free ticket" could be printed on the ticket which would entitle the player to redeem the played ticket for a free ticket. Another award set such as {$0.00, -$1.00, $5.00} results in an award of $4.00. Yet another award set such as {-$2.00, $4.00, x3} results in an award of $6.00.

The arrow 100' could be randomly placed in any of the five scratch play areas 130', 132', 134', 136' or 138' in play region 170'. The arrow is also randomly oriented to point in either direction. For example, if the arrow is in play area 130' and points in the direction opposite to play areas 132', 134', etc. (i.e., points to the left in Figure 21), only the authorized award area 131' directly underneath would be scratched. On the other hand, if the arrow were placed in play area 130' and points towards the remaining play areas (i.e., pointing to the right in Figure 21), the player would receive an award based upon the values in all award areas. Based upon the price of the ticket, based on the random placement, based upon the random orientation, and based on the values awarded, the probabilities can be controlled by the manufacturer of the present invention to provide a profitable return to the sponsor. There is no skill involved by the player in this game, as the player can only select one play area, and the likelihood of the player selecting a play area containing an arrow is purely a matter of chance.

Figure 22 shows the implementation of a bomb graphic 200' on a lottery ticket 210'. Scratching any scratch play area other than scratch play area 222', in play region 270', to reveal the "X" would result in no award. However, if only the scratch play area 222' containing the bomb 200' is scratched, then the player would scratch the award area 223' directly under the bomb 200' and the two adjacent award areas 221' and 225' located on either side. In the example of Figure 22, the player would scratch area 223' to reveal $5, then area

225' to reveal $2, then area 221' to reveal $3 to win an award of $10.00. The directional symbol 200', as explained in instructions 260', authorizes revealing the award areas 221', 223' and 225'. A topological area 290' contains the authorized award areas. The order of scratching these authorized areas is immaterial. It doesn't matter if all of the award areas 221', 223', 225', 227' and 229' in award region 280' are scratched. However, the player must not have scratched more than one of the play areas 220', 222', 224', 226', and 228' as to do so invalidates the ticket.

In the above two examples of a directional arrow 100' and bomb 200', a graphic is displayed. Any suitable graphic depiction can be used as a directional symbol. The directional symbol defines, per the printed instructions, the topological area of authorized award areas to be uncovered to reveal values 150'. The term "directional symbol" herein encompasses the arrow 100', the bomb 200', and other symbols that function as described. When a directional symbol is revealed, a predetermined mathematical operation is performed on values revealed within topological area 290' to calculate the award to the player. In the case of the arrow 100' of Figure 21, the mathematical operation is the summation of the numerical values displayed in topological area 190'. In the case of a bomb 200' in Figure 22, the mathematical operation is the summation of authorized values in topological area 290'. Various predetermined mathematical operations may be performed on the values within the topological area, in connection with arrow 100', bomb 200', and/or other directional symbols appearing in play regions 170' or 270' including summation, multiplication, subtraction, division, and/or other mathematical operations. Any suitable directional symbol could be utilized under the teachings of the present invention. Any number of play areas and corresponding award areas can be used. Preferably, there is a one-to-one correspondence between play and award areas, but that is not necessary.

It is to be understood that while the play areas in Figures 21 and 22 are shown linearly on the ticket, they can be located anywhere, such as in opposing corners or away from each other as discussed next. This spacing between the play areas has an advantage in that it minimizes the possibility of a player inadvertently scratching (and thereby invalidating) another play area. At the point of redemption, any perceived tampering or uncovering of two (or more) play areas would cause the ticket to be voided and not paid.

In Figure 24, a ticket 400' is shown to have instructions 410'. The ticket 400' has four play positions 420', 422', 424' and 426'. The positioning of these play positions is such as to minimize accidental scratching of other play areas so as not to void the ticket 400'. The player selects one of the four play positions to scratch as discussed above. Only one of the play positions has a directional arrow. The remaining play positions do not. As shown in Figure 24, by way of illustration, at play position 424', three arrows are shown. The arrow 430' points up (or optionally as shown by dotted lines across or diagonally). In Figure 24, when the player uncovers play position 424' an arrow 430' is uncovered, the arrow 430' pointing upward, thereby informing the player to uncover authorized award positions in column "1" of award region 440'. The topological area including the authorized award positions is shown in bold as 490'. As shown in Figure 24, the authorized awards uncovered are a set of values: {$1.00, $0.00, $2.00}. So, the player is paid $3.00. It is to be expressly understood that the arrow 430' could optionally point diagonally, thereby authorizing award areas C1, B2 and A3, or horizontally, thereby authorizing award areas in row C. The order of steps in Figure 23 can vary. For example, a player may scratch off all award areas in an award region first as this is actually immaterial to the present invention. Those authorized awards exist in the topological area authorized by the directional symbol and explained by the instructions.

In Figure 25, another embodiment is set forth wherein the play position 524' of ticket 500' contains a directional symbol 530' which directs the player to award area E4. The instructions 510' inform the player that the authorized award areas are E4 and all areas adjacent thereto, so that the set of authorized award areas would be {E3, E4, E5, D3, D4, D5} as shown by topological area 590'. The payout set for the above-identified award areas is {$0.00, $3.00, $1.00, $1.00, $0.00, $2.00} for a payout of $7.00.

What is described above in Figures 21 and 22 is a scratch lottery ticket having a plurality of scratch play areas in a play region wherein one of the scratch play areas has a directional symbol such as arrow 100' or bomb 200'. The directional symbol directs the player, based on information contained on the ticket, to scratch award areas in a topological area to be scratched and uncovered. The authorized award areas are to be scratched pursuant to the instructions on the ticket pertaining to the directional symbol. A predetermined mathematical operation is performed on the revealed values to calculate a resulting monetary award to the player.

In Figure 23, the method of the present invention is set forth. At, typically, a retail establishment for a scratch lottery ticket or a casino for pull-tab ticket, a ticket sale 300' takes place. A player purchases the ticket for a price. The value paid for the ticket corresponds to a player of a casino gaming machine placing a wager.

After purchasing the ticket, the player in step 310' uncovers only one play area of the ticket. The player looks at the single uncovered play area, and in stage 320', a decision step occurs. If a directional symbol has been uncovered, play continues in step 330'. If a directional symbol is not found, and another symbol such as an end game symbol is uncovered, then play of the game of the present invention ends at step 340'.

When play continues in step 330', the player then proceeds to follow the instructions on the ticket pertaining to the directional

symbol, and the player uncovers the authorized award areas to reveal values in the proper topological area of the ticket. It is to be understood that even if the player uncovers all of the award areas, the award to the player would still be based only on the award amounts present in the authorized award areas. Uncovering the other award areas, however, would not invalidate the ticket.

The player returns to an establishment to redeem the ticket. In step 350' the establishment, usually a store clerk, first looks at the play area to ascertain that only one play area has been uncovered. The revealing of any other play area or any other tampering with the removable material over another play area results in invalidation of the ticket in stage 360'. If the redeemed ticket is in proper form, and only one play area is uncovered, the player is awarded monetary value in step 370' based upon the topological area and the mathematical operation performed on the displayed values.

It is to be understood that in one embodiment, once the player has uncovered a winning symbol (e.g., an arrow), then the actual award values need not be uncovered by the player. Rather, the potential award to be awarded may be encoded (e.g., bar-coded) on the ticket itself. So, the player could simply turn-in the winning ticket to a store clerk (with only the winning symbol scratched-off), and the clerk in turn would verify the ticket's veracity, and via bar-code scan determine the winning amount of the prize to be awarded. This type of bar-code scan may also be used, even if the player scratched off the award values, to verify that the revealed award matches that intended.

It is to be understood that while the foregoing examples are given in terms of purchase by the consumer, with cash prizes, other embodiments are possible. For example, the seal tickets could be given away as a promotion (e.g., at fast-food establishments) or with accompanying purchase (e.g., at a department store), with possible

awards including food prizes and/or merchandise, perhaps in addition to monetary prizes.

The above disclosure sets forth a number of embodiments of the present invention described in detail with respect to the accompanying drawings. Those skilled in this art will appreciate that various changes, modifications, other structural arrangements and/or other embodiments could be practiced under the teachings of the present invention without departing from the scope of this invention as set forth in the following claims.

WHAT IS CLAIMED IS:

1. A casino bonus game for an underlying casino game machine, said casino bonus game comprising:

a playing field;

a ball, said ball propelled onto said playing field when an initiate condition occurs during the play of said underlying game;

a row of lanes on said playing field, said ball after traversing said playing field traveling through one of said lanes in said row;

a display at said row of lanes on said playing field for displaying at least one target across a plurality of said lanes;

a game response indication when said ball travels through said one lane, said game response indication being an award when said at least one target is hit.

2. The casino bonus game of claim 1 wherein said at least one target is randomly displayed.

3. The casino bonus game of claim 1 wherein said at least one target has a payoff value different from lanes not having said at least one target.

4. The casino bonus game of claim 1 wherein said casino underlying game machine is a slot machine, said slot machine having a plurality of reels and a payline.

5. The casino bonus game of claim 4 wherein said initiate condition occurs when a bonus game symbol appears on said payline during the play of said slot machine game.

6. The casino bonus game of claim 1 wherein said initiate condition is an accumulated value based upon said play of said underlying game machine.

7. The casino bonus game of claim 1 wherein the at least one target is a plurality of targets, and wherein at least one of the plurality of targets displays a special effect; when said one target displaying the special effect is hit, then increasing said award.

8. The casino bonus game of claim 1 wherein the at least one target moves across lanes in said row.

9. The casino bonus game of claim 1 wherein said display further randomly displays at least one end-of-game target in at least one lane in said row, said casino bonus game ending when said end-of-game target is hit.

10. The casino bonus game of claim 1 wherein when said ball travels through one said lane with no target the casino bonus game ends.

11. The casino bonus game of claim 1 wherein when said ball travels through one said lane with no target, then a new ball is propelled.

12. The casino bonus game of claim 1 wherein when said at least one target is hit, then a new ball is propelled.

13. The casino bonus game of claim 1 further comprising:

a credit meter,

a ball sensor in each of said lanes;

a controller, said controller in response to said initiate condition occurring (1) randomly displaying said at least one target in said display, (2) activating a launch mechanism, (3) receiving a signal from the ball sensor at said lane said ball traveled through, (4) determining

whether said at least one target is hit, and (5) incrementing said credit meter with a payoff for hitting the target.

14. The casino bonus game of claim 1 wherein said display displays at least one second target of a second type and wherein said game response indication is an end of bonus game indication when said at least one target of the second type is hit.

15. The casino bonus game of claim 1 wherein a second game response indication occurs when said ball travels through said one lane missing said at least one target.

16. The casino bonus game of claim 13 wherein said second game response indication is a replay indication of said casino bonus game.

17. A casino game comprising:

a playing field;

a ball, said ball propelled onto said playing field;

a row of lanes on said playing field, said ball after traversing said playing field traveling through one of said lanes;

a display at said row of lanes on said playing field, said display randomly displaying a plurality of targets;

a ball sensor in each of said lanes;

a controller, said controller randomly displaying said plurality of targets in said display, activating said launch mechanism, receiving a signal from the ball sensor at said lane said ball traveled through, and determining whether a target is hit and issuing a game response indication when said target is hit.

18. A method for playing a bonus casino game comprising:

starting play of the bonus casino game when a bonus condition occurs in an underlying casino game;

randomly displaying a plurality of targets at exit lanes of the bonus casino game;

propelling a ball onto a playing field for said bonus casino game, the ball exiting one of the exit lanes;

determining whether the exit lane the ball traveled through has a target displayed;

issuing a game response indication when a target is determined to be at the aforesaid lane;

randomly displaying a plurality of new targets at the exit lanes in response to issuing a game response indication,

propelling another ball onto the playing field, the another ball exiting one of the exit lanes,

determining whether the aforesaid one exit lane has a new target,

issuing a second game response indication when a new target is determined to be at the aforesaid one exit lane.

19. The method of claim 18 wherein the plurality of new targets is the plurality of targets with the determined target removed.

20. The method of claim 18 wherein the number of the plurality of new targets is different from the number of plurality of targets.

21. The method of claim 18 further comprising:

displaying a set of objects in response to the issuance of a game response indication,

receiving an input from a player selecting one of the objects in the set,

revealing an award associated with the selected one object.

22. The method of claim 18 further comprising:

displaying a set of objects in response to the issuance of a second game response indication,

receiving an input from a player selecting one of the objects in the set,

revealing an award associated with the selected one object.

23. A method for playing a bonus casino game comprising:

starting play of the bonus casino game when a bonus condition occurs in an underlying casino game;

randomly displaying a series of single digit numbers at exit lanes of the bonus casino game, one single digit number displayed at each of said exit lanes;

sequentially launching a pre-determined number of balls onto a playing field for said bonus casino game, each of the pre-determined number of balls exiting one of the exit lanes;

determining the displayed random number at the exit lane for each of the pre-determined number balls based upon when the balls exited the lanes;

issuing a game response indication in the form of a number read wherein each number read corresponds to a decimal number placement for a decimal number.

24. The method of claim 23 further comprising the step of:

providing an award based on the maximum number created from the number read.

25. The method of claim 23 further comprising the step of:

providing an award based on the number read.

26. The method of claim 23 wherein at least one graphic symbol is added to the series of numbers, said at least one graphic

symbol providing an additional game feature when a launched ball travels through a lane containing the graphic symbol.

27. The method of claim 26 wherein the additional game feature is launching another ball.

28. The method of claim 26 wherein the additional game feature is performing a mathematical operation on the number read.

29. A method for playing a bonus casino game comprising:

starting play of the bonus casino game when a bonus condition occurs in an underlying casino game;

randomly displaying a plurality of numerical award values at exit lanes of the bonus casino game, one of said plurality of numerical values displayed at each of a corresponding number of said exit lanes;

randomly displaying at least one graphic in an exit lane not displaying one of said plurality of numerical award values;

launching a ball onto a playing field for said bonus casino game, the ball exiting one of the exit lanes;

when the ball exits the lane displaying the at least one graphic, then performing a predetermined mathematical operation based on the graphic;

issuing a game response indication based on the predetermined mathematical operation.

30. The method of claim 29 wherein the graphic is an arrow.

31. The method of claim 29 wherein the mathematical operation is a summation.

32. The method of claim 29 wherein the mathematical operation is a summation within a topological area.

33. The method of claim 29 wherein the mathematical operation is a multiplication at a set amount and further comprising launching another ball, the value of the number displayed at the lane the another ball traveled through multiplied by the set amount to form an award.

34. A method for playing a bonus casino game interacting with its underlying casino game comprising:

randomly displaying a game outcome in the underlying casino game, the game outcome based on a plurality of different symbols;

randomly displaying at least one of the plurality of different symbols at at least one of the exit lanes of the bonus casino game when a bonus trigger occurs in the underlying casino game;

propelling a ball onto a playing field for the bonus casino game, the ball exiting one of the exit lanes;

determining whether the exit lane the ball traveled through has the at least one symbol displayed;

converting all symbols corresponding to the aforesaid displayed symbol to a wild symbol in the game outcome in response to the aforesaid determining;

paying based upon the game outcome having the converted wild symbols.

35. A method for playing a bonus casino game interacting with its underlying casino game comprising:

randomly displaying a game outcome in the underlying casino game, the game outcome comprising a plurality of different symbols arranged in a plurality of columns;

propelling a ball onto a playing field for the bonus casino game, the ball exiting one of the exit lanes, each lane corresponding to a column in the plurality of columns;

determining the exit lane the ball traveled through and its corresponding column;

converting each of the symbols in the determined corresponding column of the game outcome to wild symbols;

paying based upon the game outcome having the converted wild symbols.

36. A seal card game comprising:

a ticket;

a plurality of play areas on the ticket, each of said plurality of play areas having a hidden symbol, only one said hidden symbol on said ticket being a directional symbol, the remaining hidden symbols being end of game symbols,

a corresponding plurality of award areas on the ticket, each of the plurality of award areas containing a hidden value,

an award provided on the ticket only when a play area is uncovered to reveal the hidden directional symbol, the award determined by uncovering authorized award areas in a topological area authorized by the directional symbol, the award based on a predetermined mathematical operation performed on values revealed in the uncovered authorized award areas.

37. The seal card game of claim 36 wherein the hidden directional symbol is a graphic depiction of an arrow.

38. The seal card game of claim 36 wherein the hidden directional symbol is a graphic depiction of a bomb.

39. The seal card game of claim 36 wherein the mathematical operation comprises summing the values in uncovered authorized award areas.

40. The seal card game of claim 36 wherein at least one of the values in the uncovered authorized award areas is a multiplier.

41. The seal card game of claim 36 wherein the ticket is a scratch lottery ticket.

42. The seal card game of claim 36 wherein the ticket is a pull ticket.

43. A method for playing a seal card game comprising:

providing a plurality of play areas on a ticket, each of the plurality of play areas having a hidden symbol, only one said hidden symbol on the ticket being a directional symbol,

providing a plurality of award areas on the ticket,

removing removable material over only one of said plurality of play areas to reveal the hidden symbol,

removing removable material over the award areas in the plurality of award areas only as authorized when the directional symbol is revealed,

paying an award based upon a revealed value in each uncovered authorized award area.

44. The method of claim 43 wherein the hidden symbol is a graphic depiction of an arrow.

45. The method of claim 43 wherein the hidden symbol is a graphic depiction of a bomb.

46. The method of claim 43 wherein the paid award is based on summing said values included in said revealed authorized award areas.

47. The method of claim 43 wherein at least one of the values in the revealed award areas is a multiplier.

48. The method of claim 43 wherein the ticket is a scratch lottery ticket.

49. The method of claim 43 wherein the ticket is a pull ticket.

50. A method for playing a sealed card game comprising:

purchasing a ticket containing the sealed card game upon payment of value by a player,

uncovering, by the player, only one of a plurality of play areas on the ticket to reveal a hidden symbol,

ending the sealed card game for the player when the uncovered hidden symbol on the ticket is an end of game symbol,

uncovering, by the player, award areas in a topological area of the ticket authorized by the uncovered hidden symbol when the uncovered hidden symbol is a directional symbol, the uncovered authorized award areas revealing hidden values,

awarding the player monetary value determined by performing a predetermined mathematical operation on the revealed hidden values,

voiding the sealed card game when more than one play area is uncovered.

Fig. 1

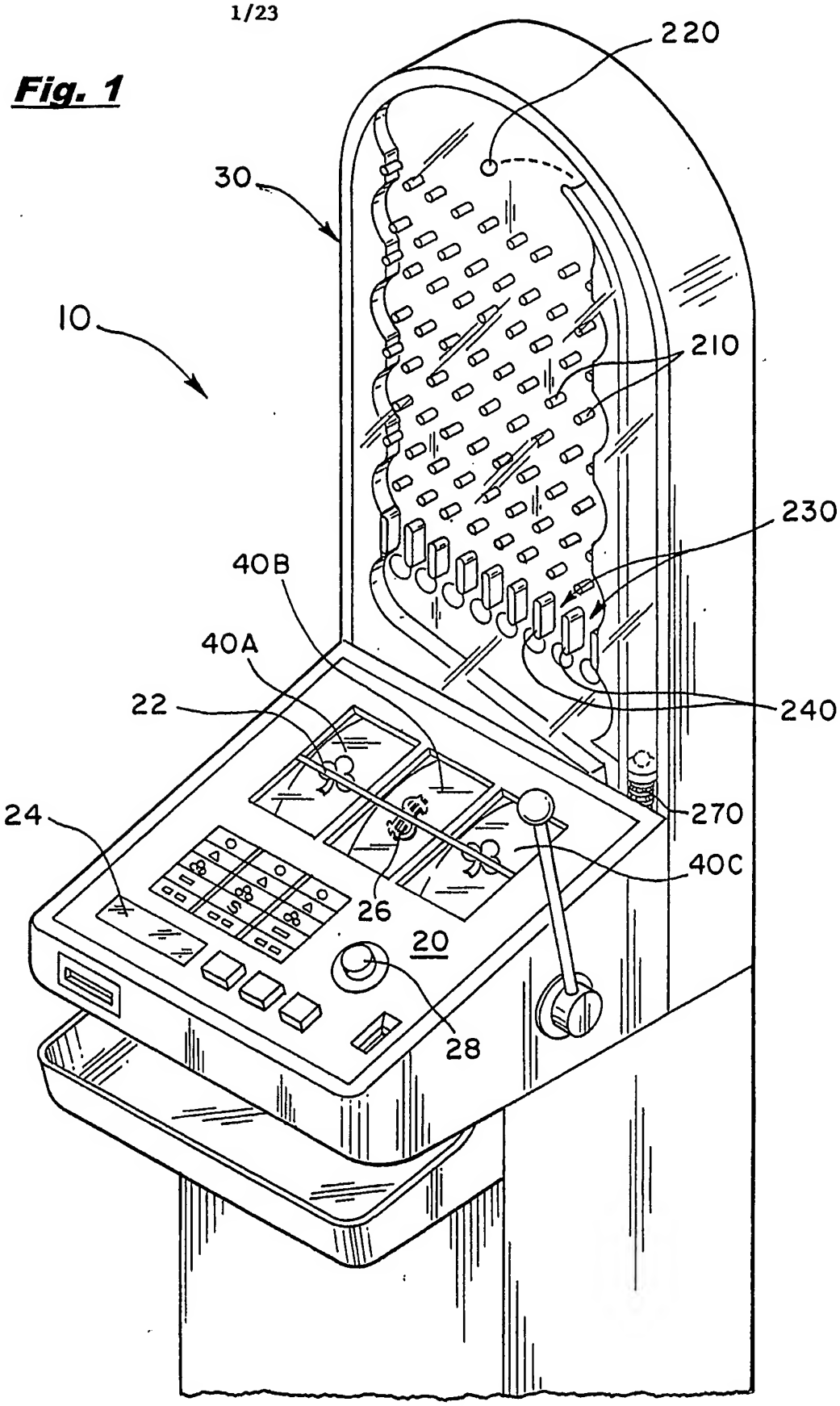


Fig. 2

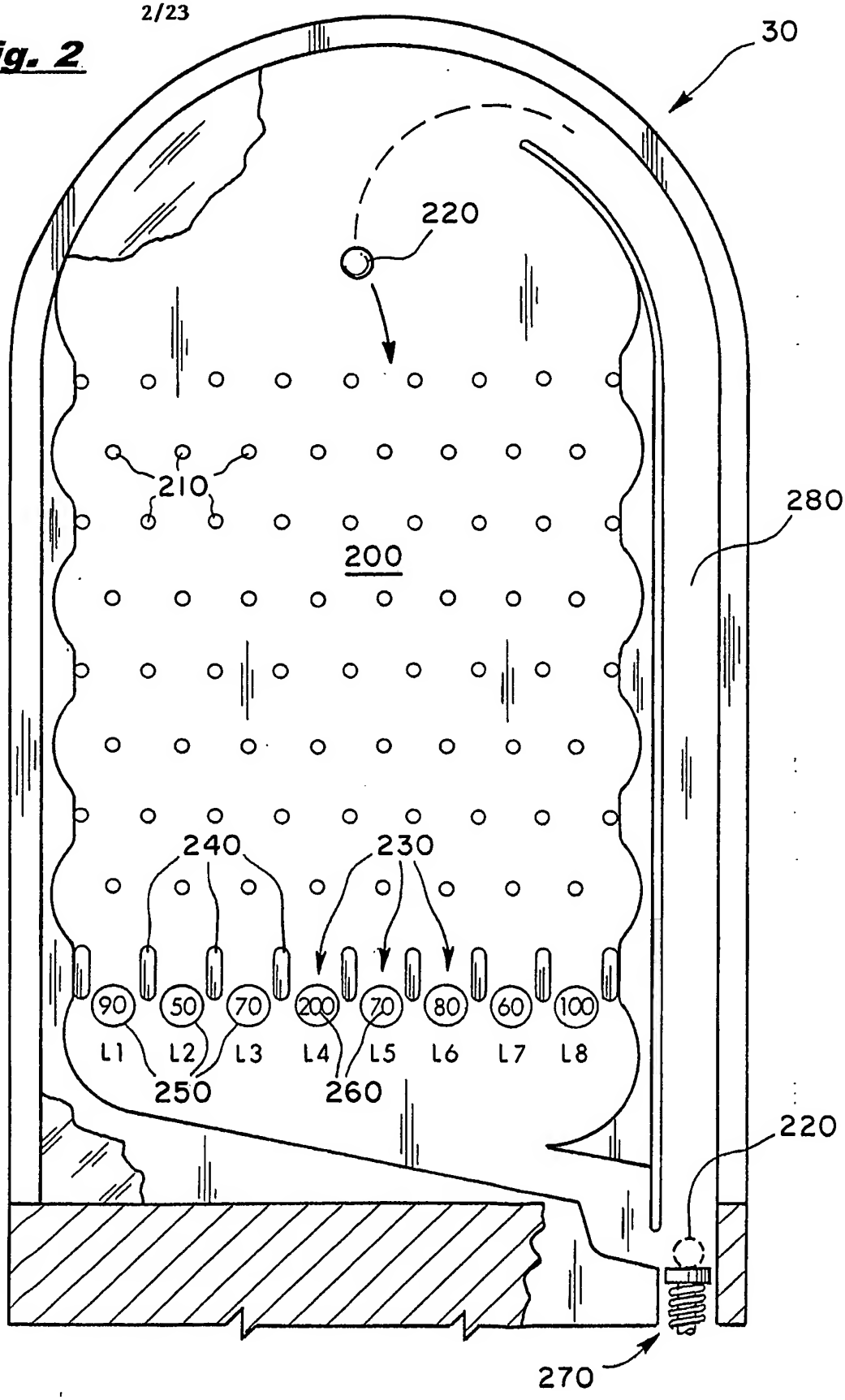
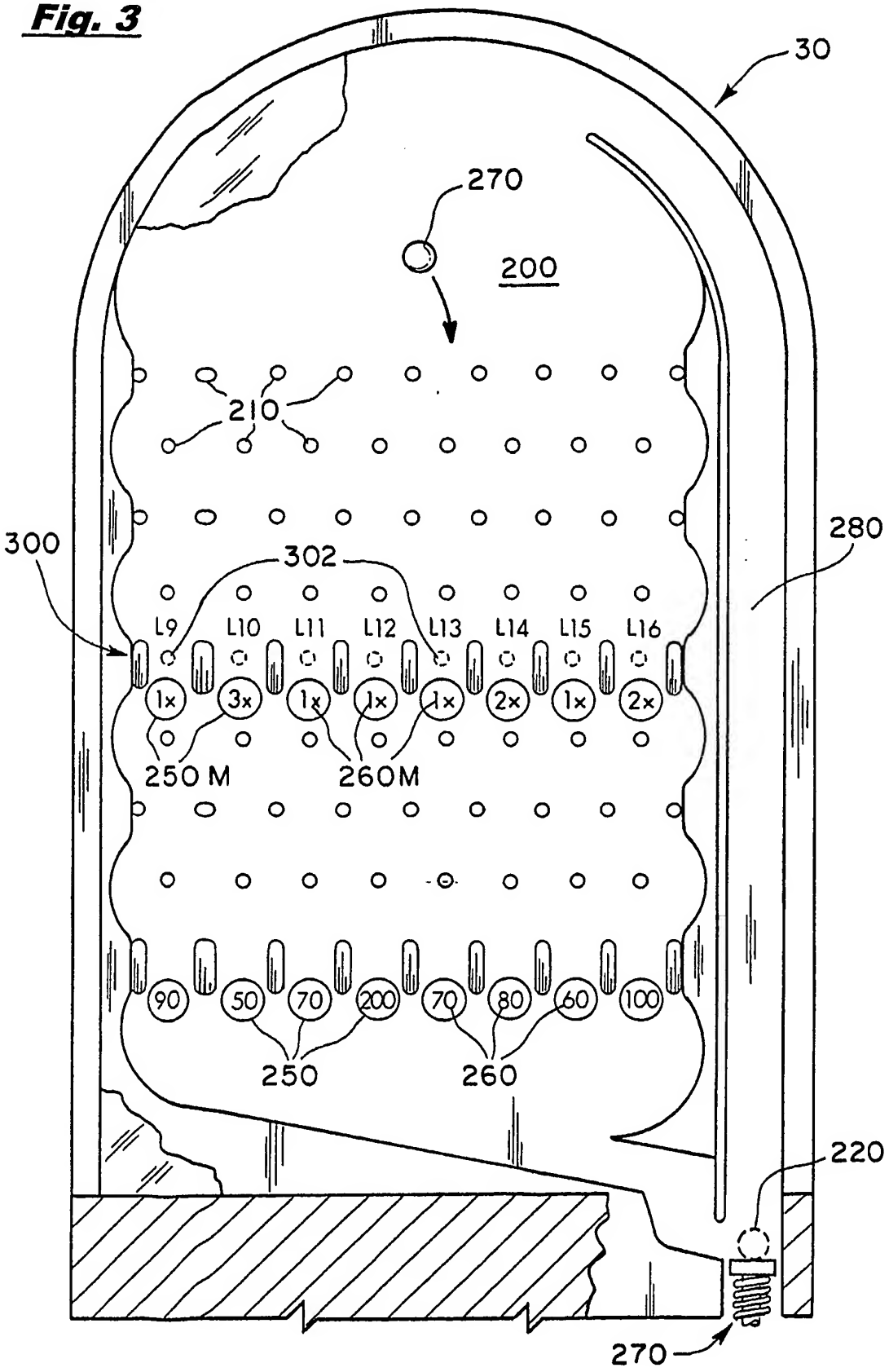

30
220
210
280
200
240
230
90
50
70
200
70
80
60
100
L1
L2
L3
L4
L5
L6
L7
L8
250
260
220
270

Fig. 3


30
270
200
210
300
302
280
L9
L10
L11
L12
L13
L14
L15
L16
1x
3x
1x
1x
1x
2x
1x
2x
250 M
260M
90
50
70
200
70
80
60
100
250
260
220
270

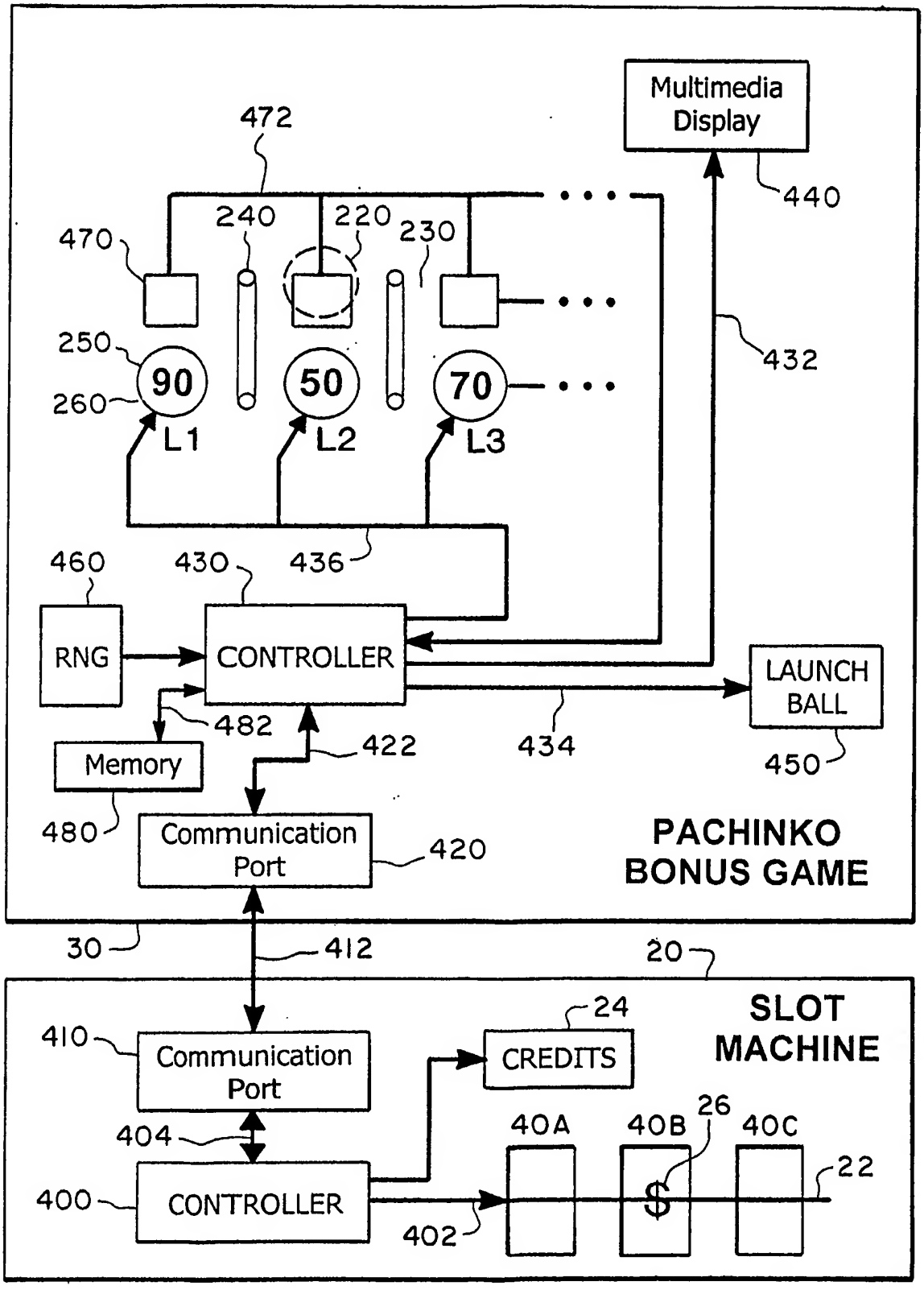

Multimedia Display
472
440
240
220
230
470
250
90
50
70
260
L1
L2
L3
432
436
460
430
RNG
CONTROLLER
LAUNCH BALL
482
422
434
450
Memory
480
Communication Port
420
PACHINKO BONUS GAME
30
412
20
24
SLOT MACHINE
410
Communication Port
CREDITS
404
40A
40B
26
40C
22
400
CONTROLLER
402
$

Fig. 4

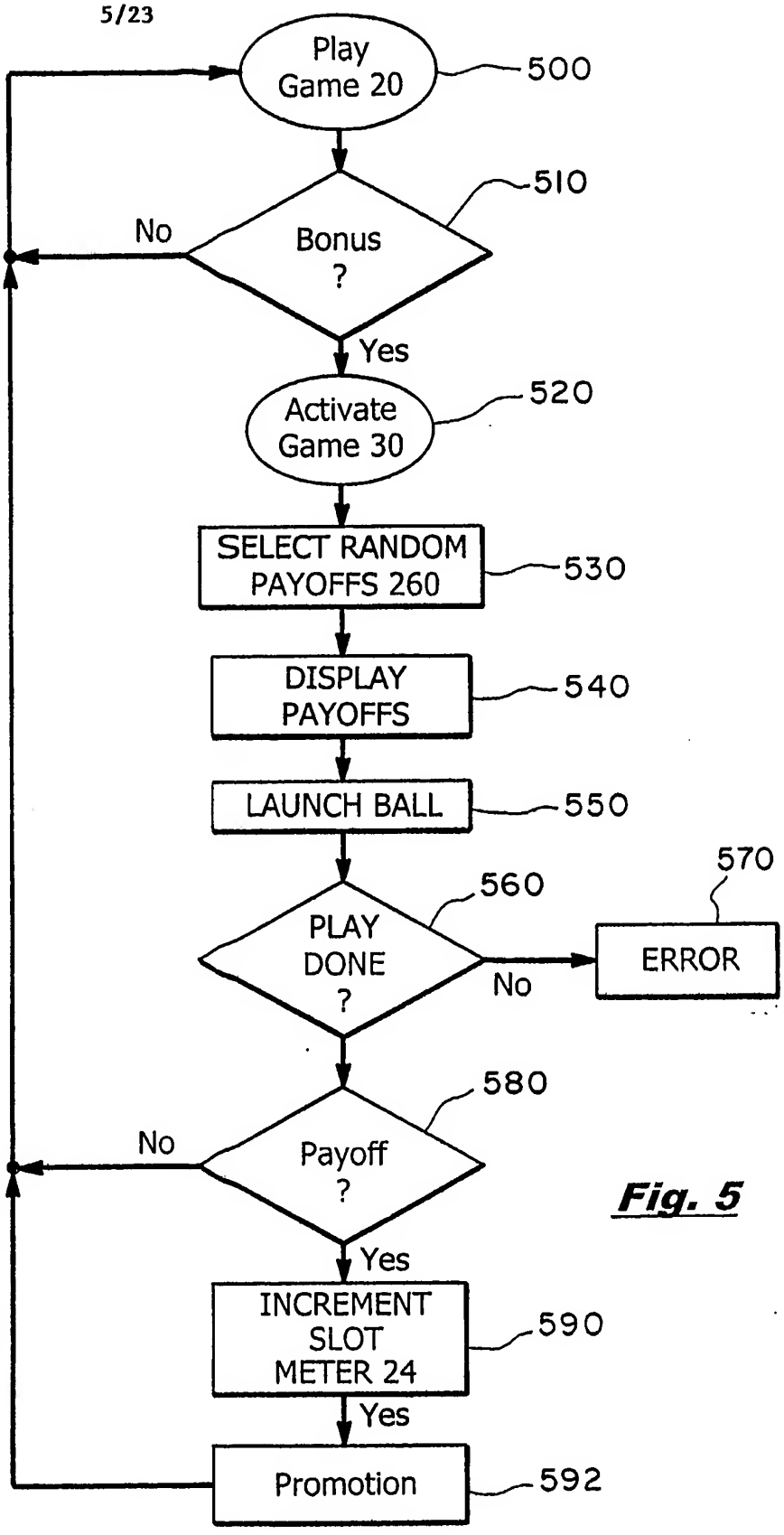

Play Game 20
500
Bonus ?
510
No
Yes
Activate Game 30
520
SELECT RANDOM PAYOFFS 260
530
DISPLAY PAYOFFS
540
LAUNCH BALL
550
PLAY DONE ?
560
570
ERROR
No
Payoff ?
580
No
Yes
INCREMENT SLOT METER 24
590
Yes
Promotion
592

Fig. 5

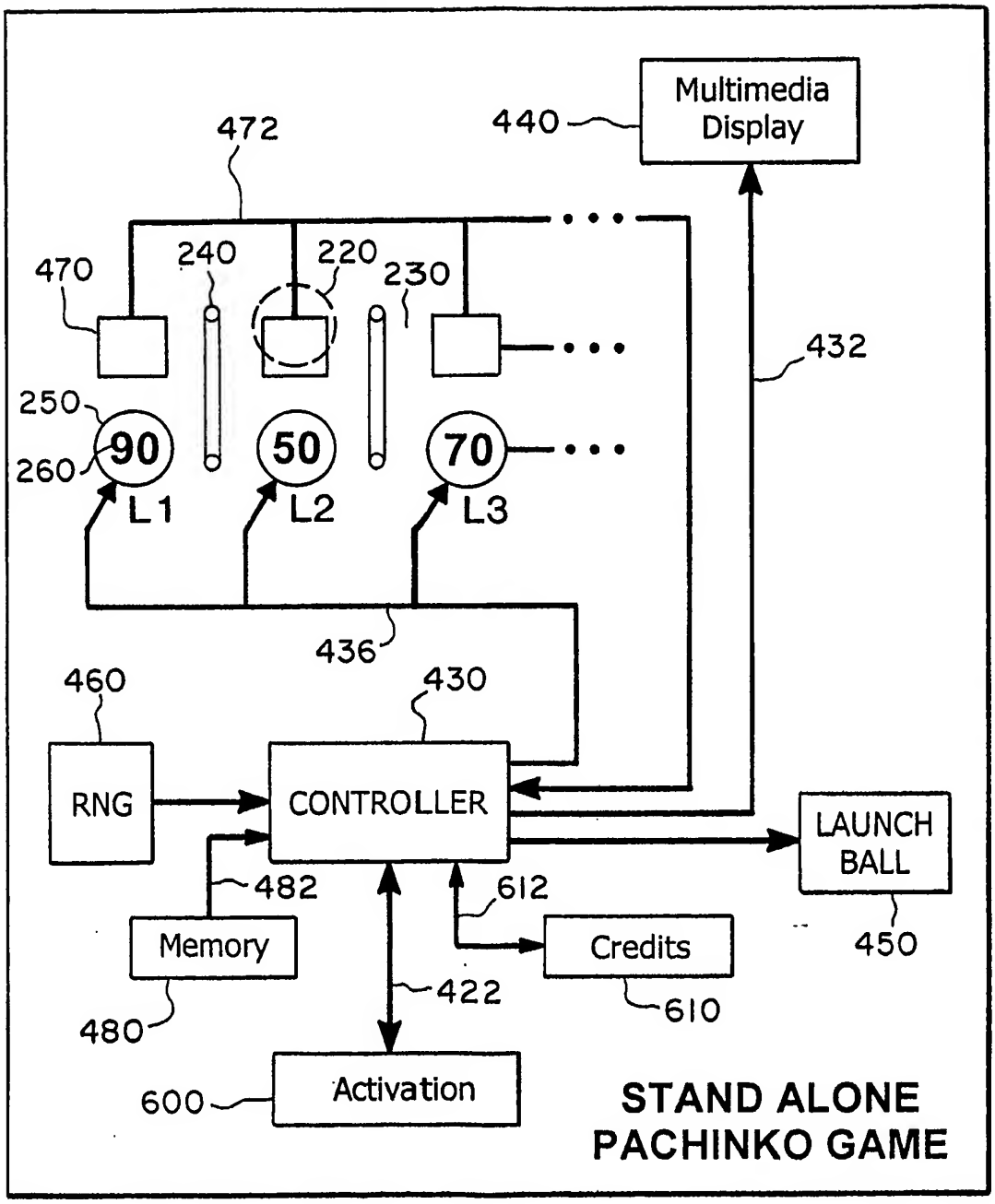

Multimedia Display
440
472
470
240
220
230
432
250
260
90
50
70
L1
L2
L3
436
460
430
RNG
CONTROLLER
LAUNCH BALL
482
612
Memory
Credits
450
422
480
610
600
Activation
STAND ALONE PACHINKO GAME

Fig. 6

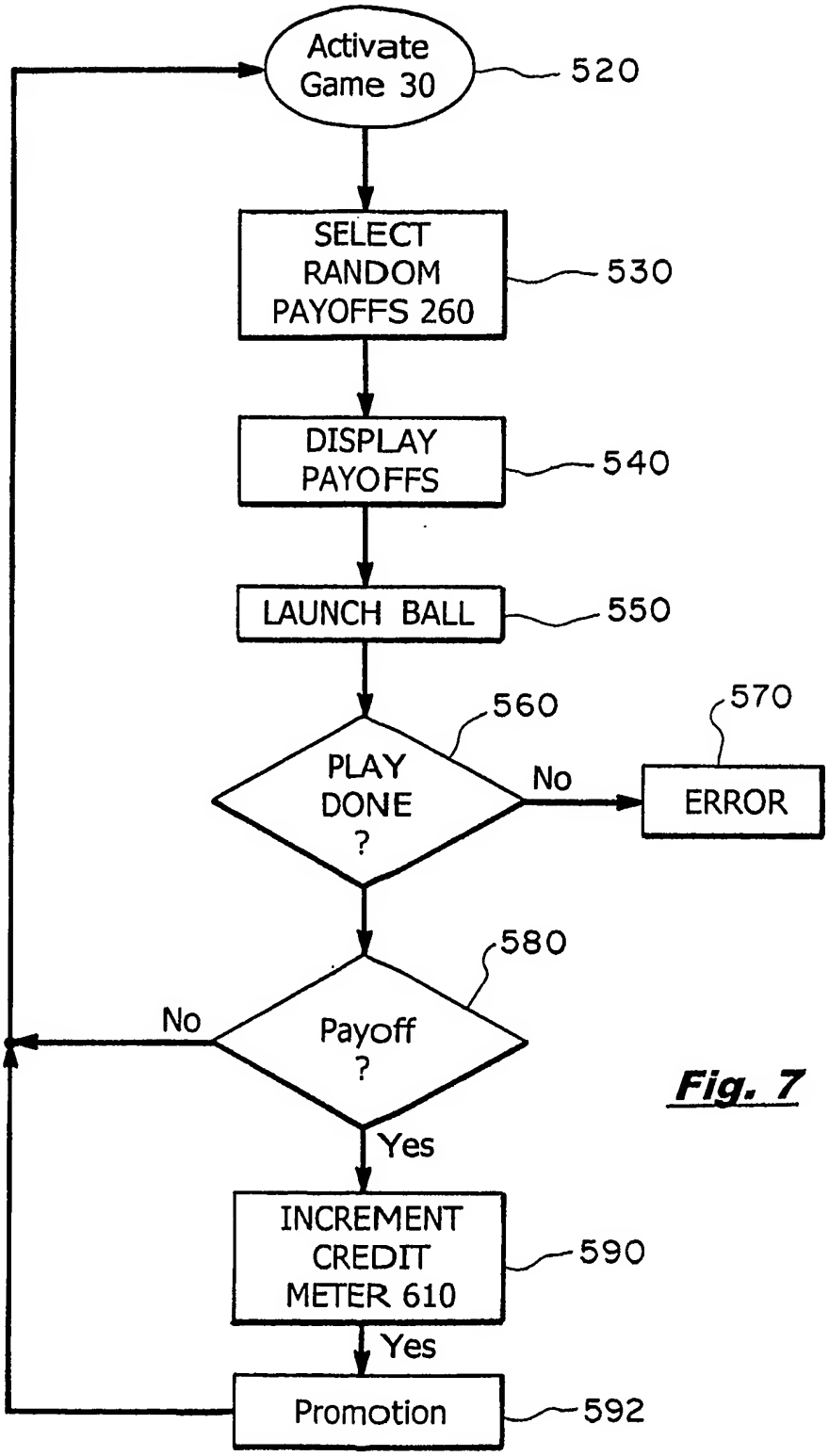
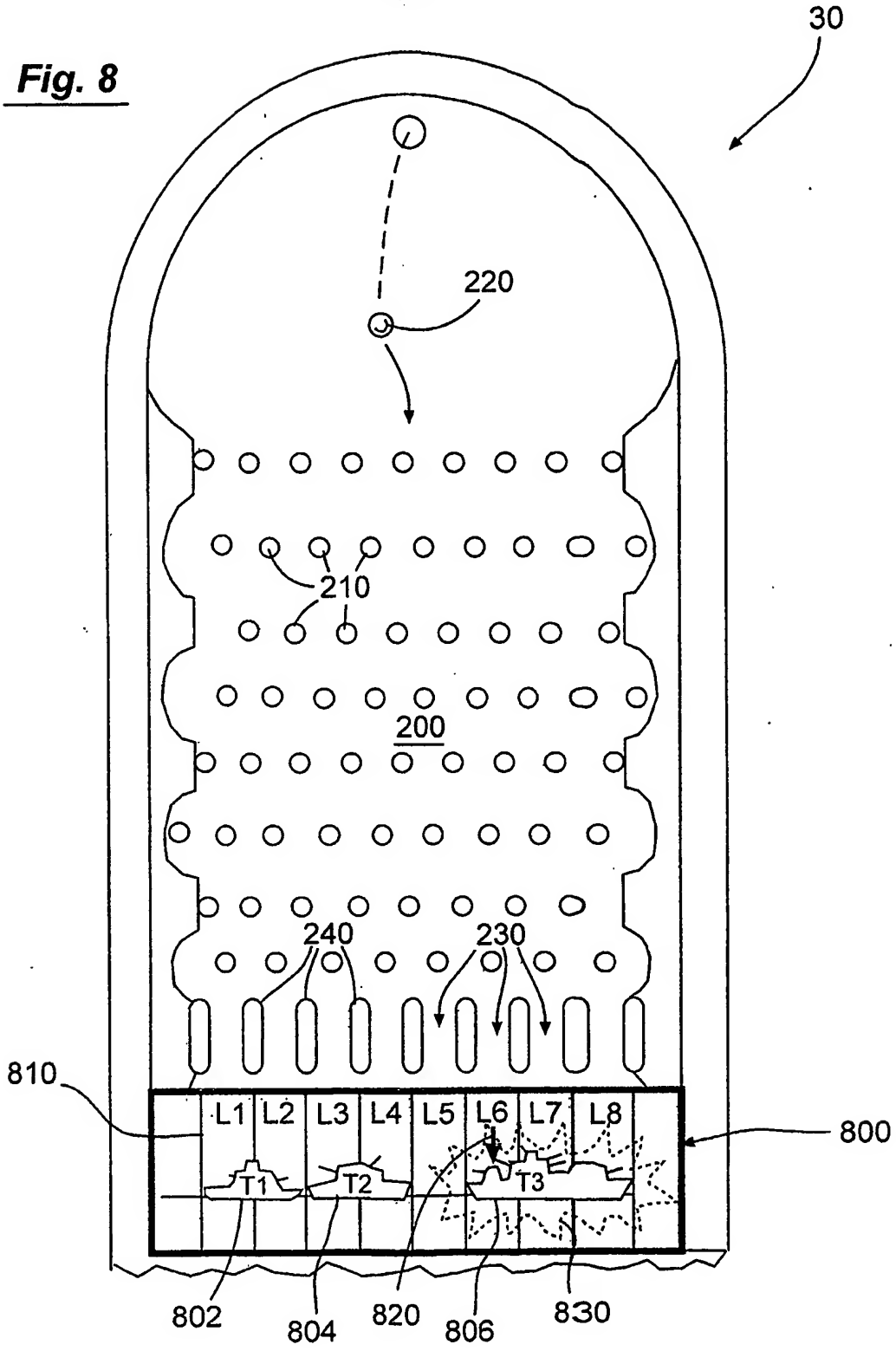

Activate Game 30
520
SELECT RANDOM PAYOFFS 260
530
DISPLAY PAYOFFS
540
LAUNCH BALL
550
560
PLAY DONE ?
No
570
ERROR
580
No
Payoff ?
Yes
INCREMENT CREDIT METER 610
590
Yes
Promotion
592

Fig. 7

Fig. 8


30
220
210
200
240
230
810
L1
L2
L3
L4
L5
L6
L7
L8
800
T1
T2
T3
802
804
820
806
830

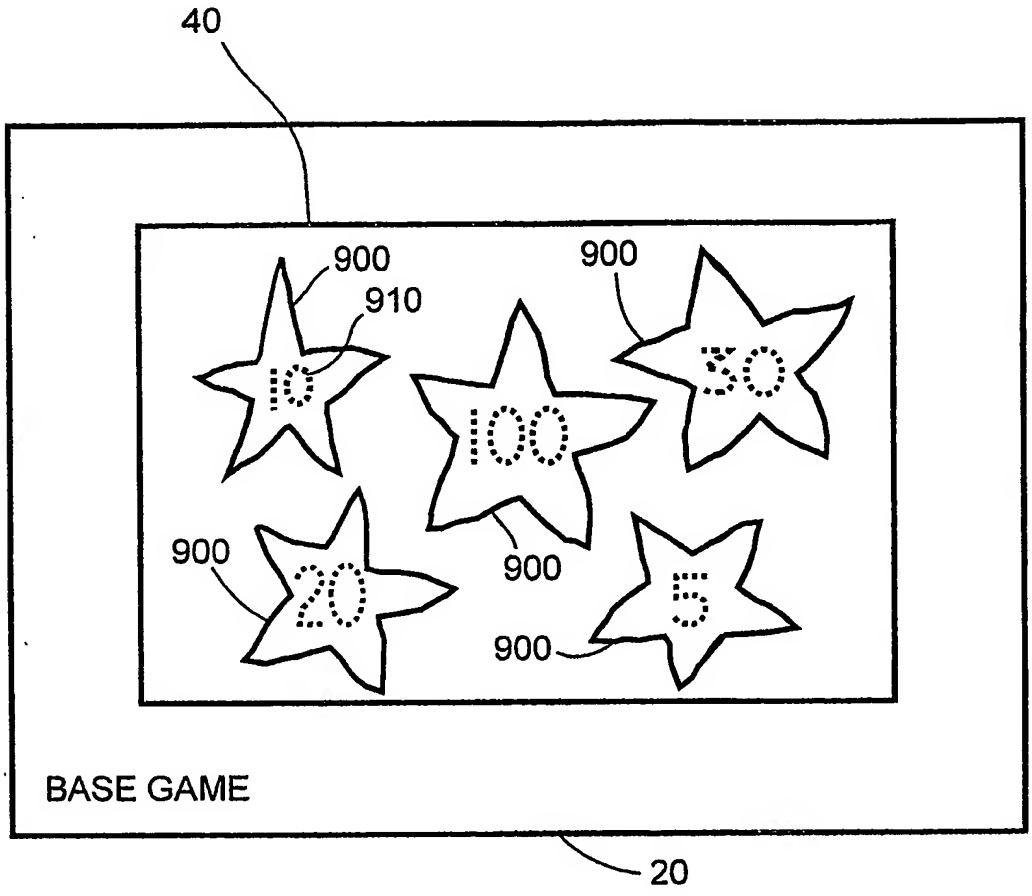


Fig. 9

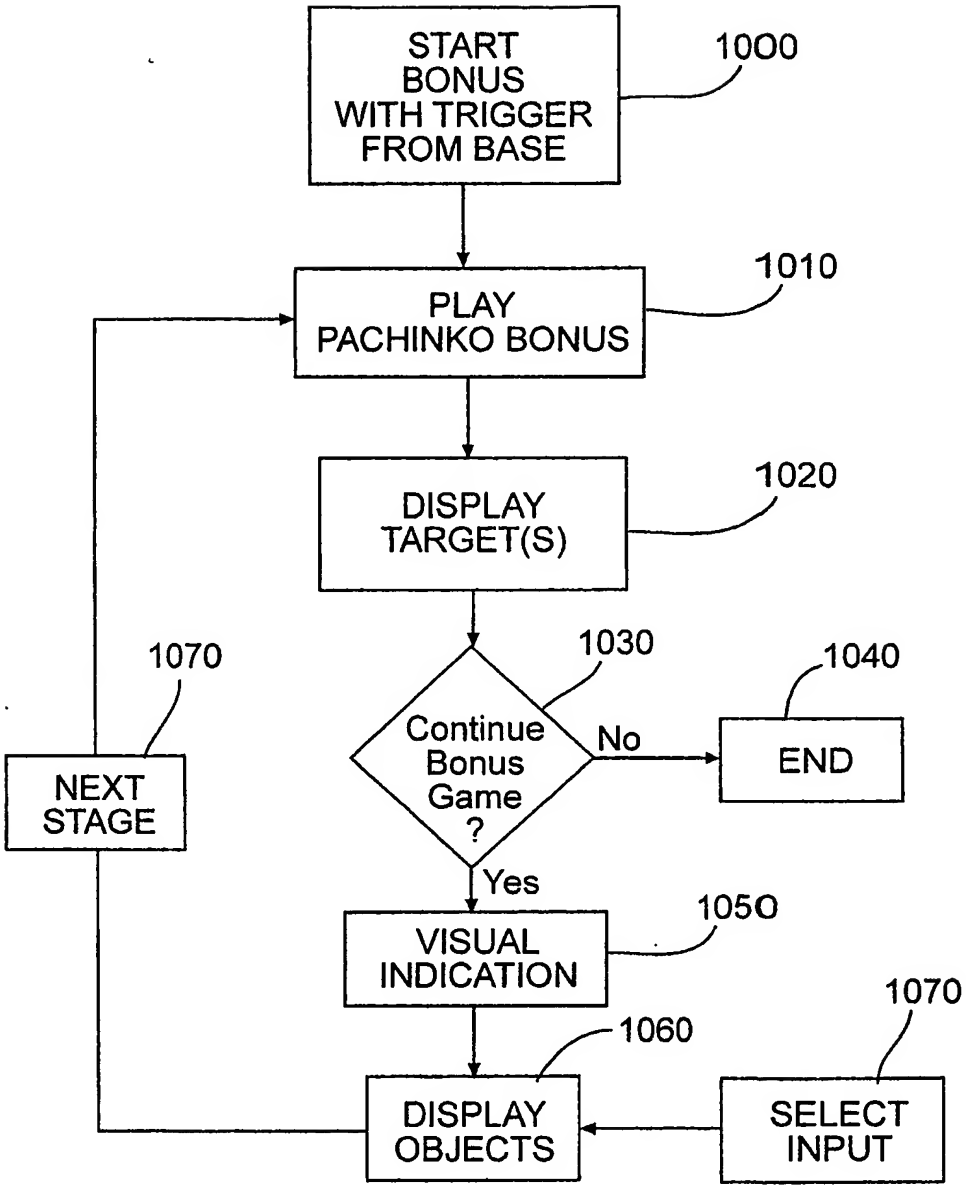

START BONUS WITH TRIGGER FROM BASE
1000
PLAY PACHINKO BONUS
1010
DISPLAY TARGET(S)
1020
Continue Bonus Game ?
1030
No
END
1040
Yes
NEXT STAGE
1070
VISUAL INDICATION
1050
DISPLAY OBJECTS
1060
SELECT INPUT
1070

Fig. 10

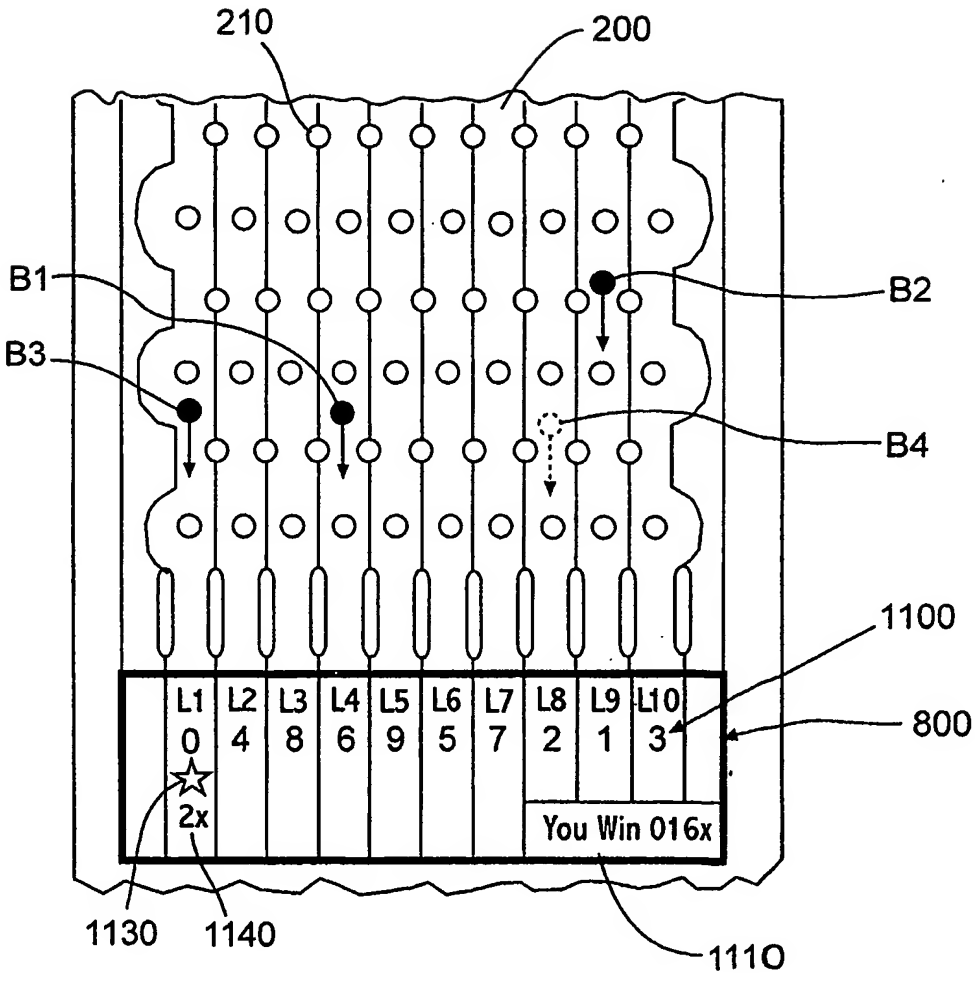

210
200
B1
B2
B3
B4
1100
800
L1 0
L2 4
L3 8
L4 6
L5 9
L6 5
L7 7
L8 2
L9 1
L10 3
2x
You Win 016x
1130
1140
1110

Fig. 11

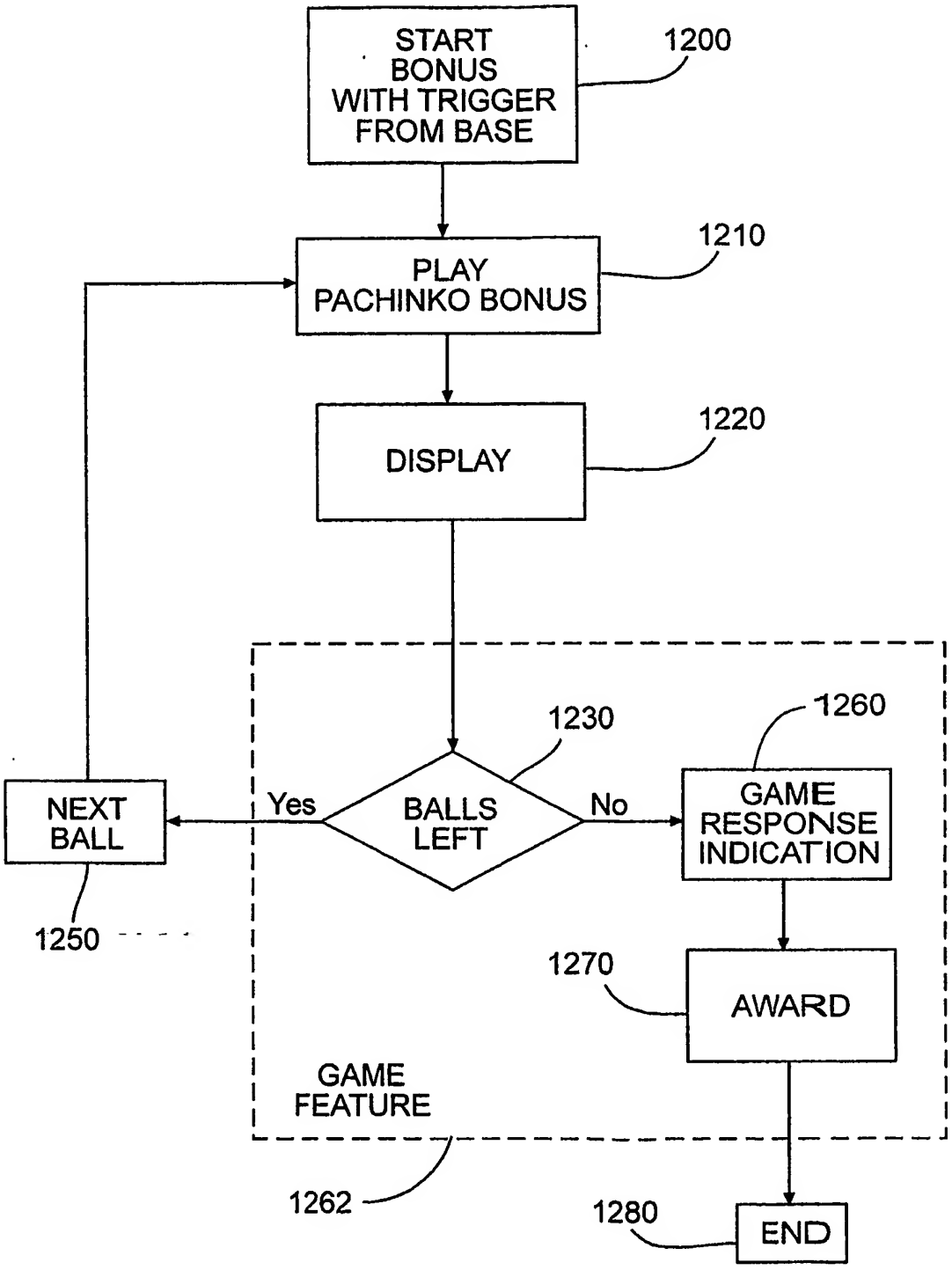

START BONUS WITH TRIGGER FROM BASE
1200
PLAY PACHINKO BONUS
1210
DISPLAY
1220
1230
BALLS LEFT
Yes
No
NEXT BALL
1250
1260
GAME RESPONSE INDICATION
1270
AWARD
GAME FEATURE
1262
1280
END

Fig. 12

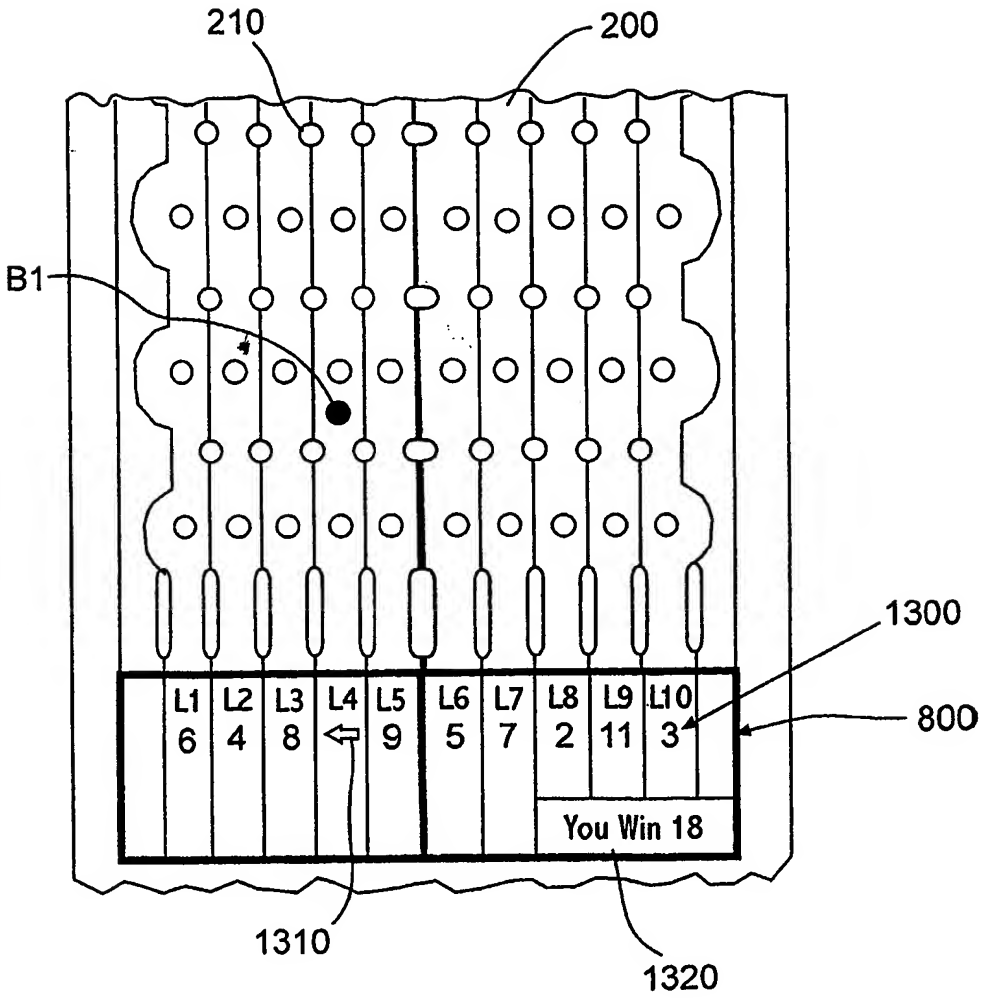

210
200
B1
1300
800
L1 6
L2 4
L3 8
L4
L5 9
L6 5
L7 7
L8 2
L9 11
L10 3
You Win 18
1310
1320

Fig. 13

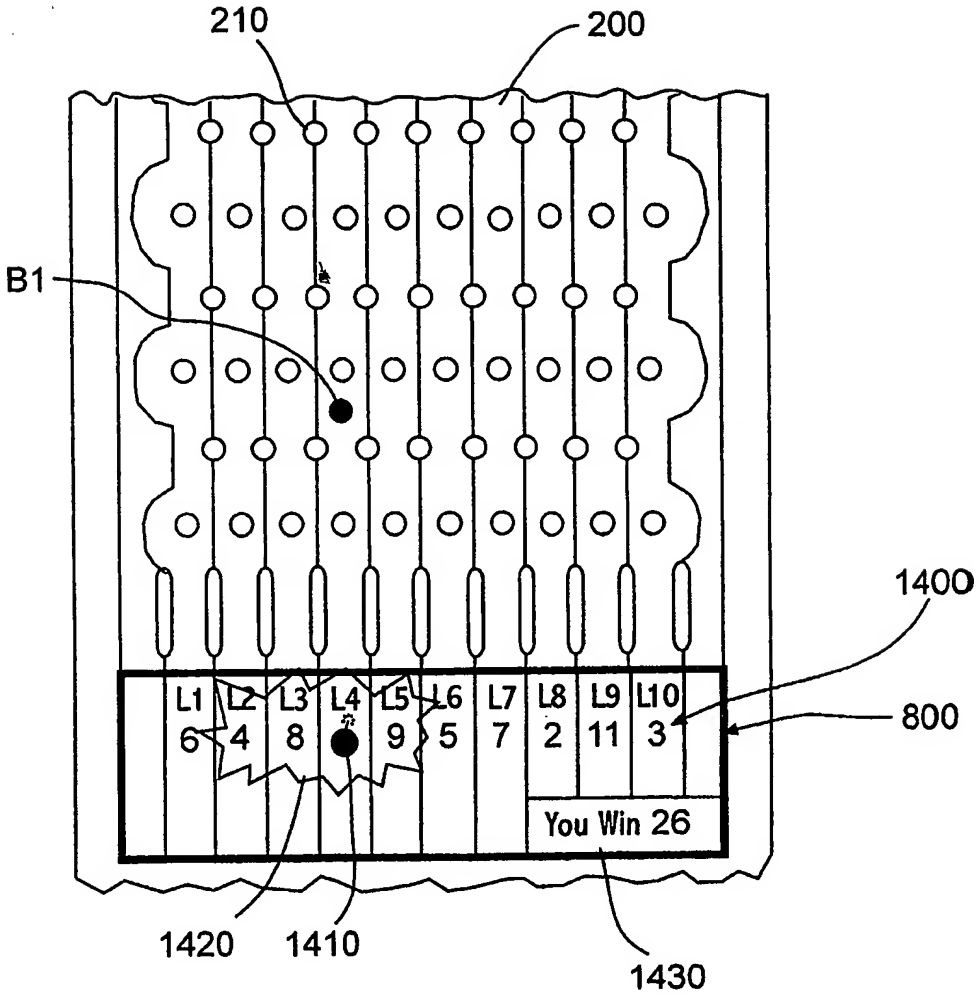

210
200
B1
1400
L1 L2 L3 L4 L5 L6 L7 L8 L9 L10
6 4 8 9 5 7 2 11 3
800
You Win 26
1420
1410
1430

Fig. 14

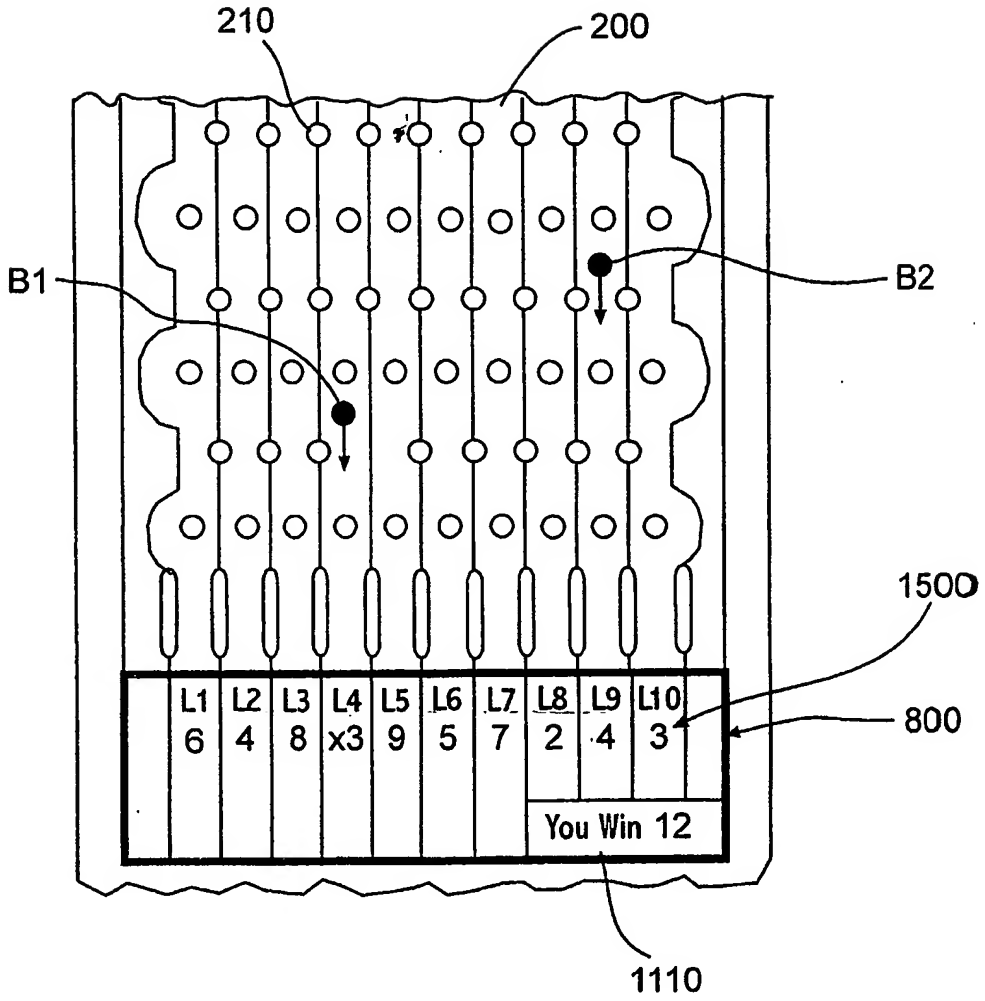

210
200
B1
B2
1500
L1 L2 L3 L4 L5 L6 L7 L8 L9 L10
6 4 8 x3 9 5 7 2 4 3
800
You Win 12
1110

Fig. 15

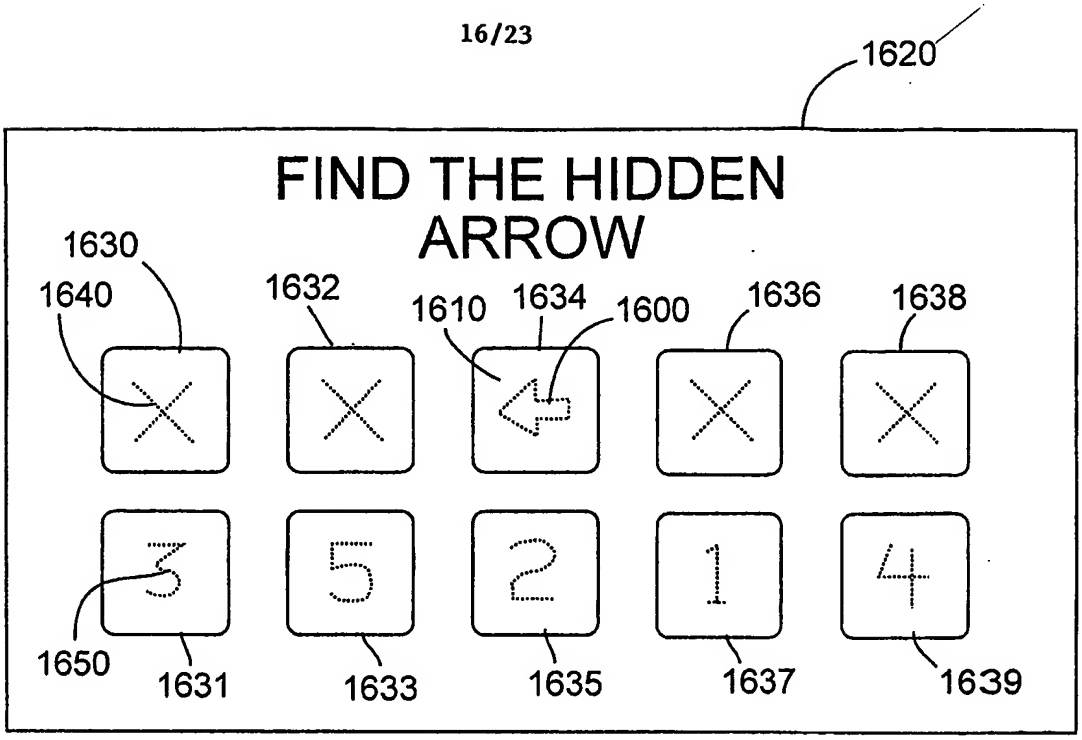

1620
FIND THE HIDDEN ARROW
1630
1640
1632
1610
1634
1600
1636
1638
3
5
2
1
4
1650
1631
1633
1635
1637
1639

Fig. 16

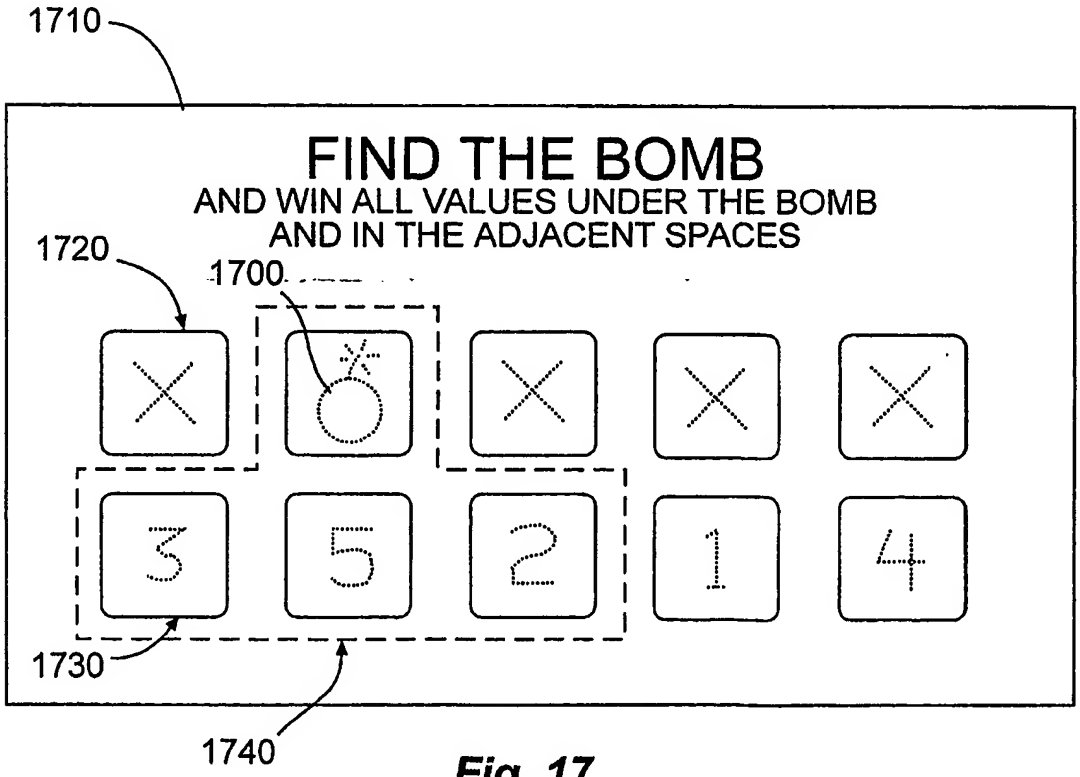

1710
FIND THE BOMB
AND WIN ALL VALUES UNDER THE BOMB
AND IN THE ADJACENT SPACES
1720
1700
3
5
2
1
4
1730
1740

Fig. 17

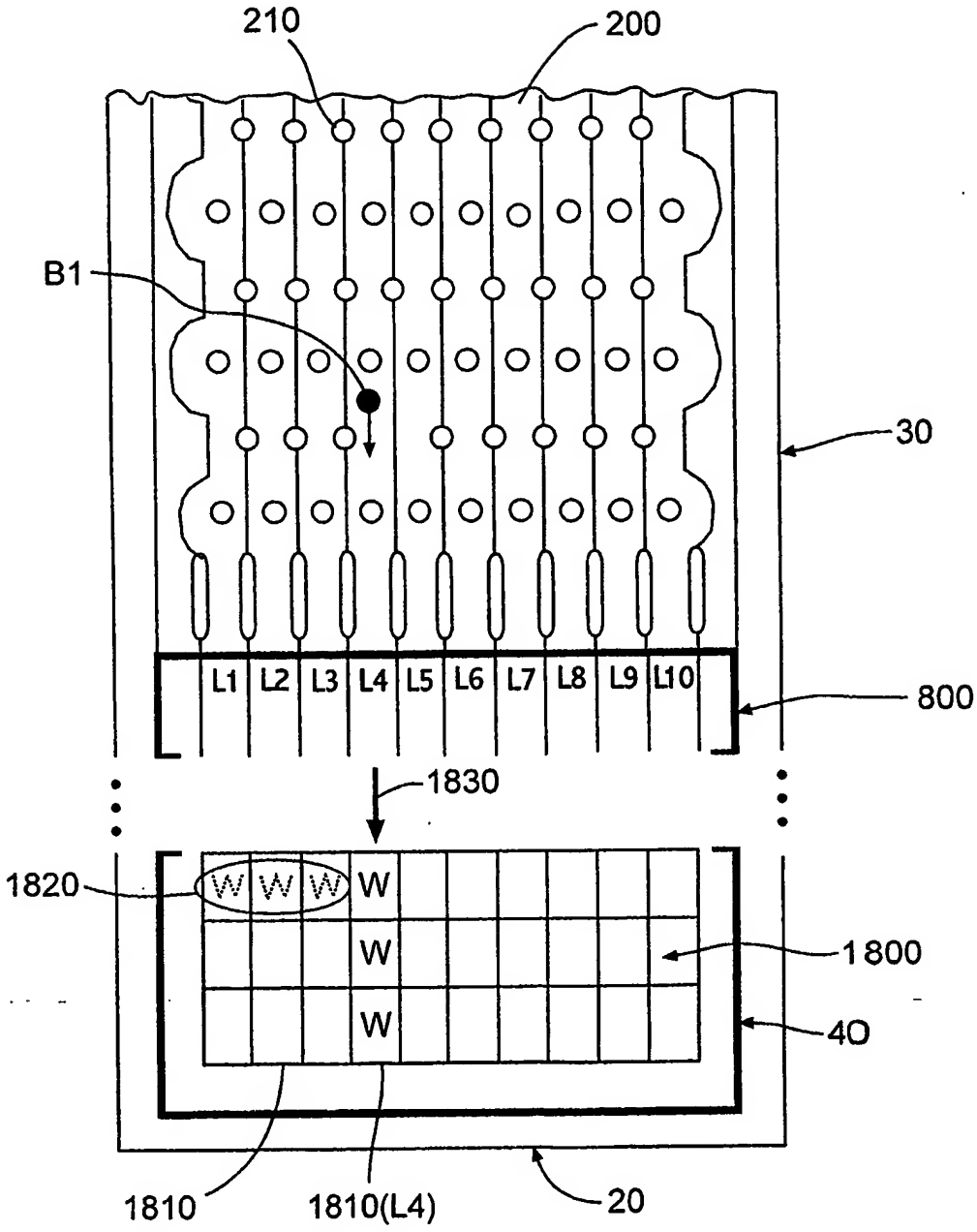

210
200
B1
30
L1
L2
L3
L4
L5
L6
L7
L8
L9
L10
800
1830
1820
W
W
W
W
W
W
1800
40
1810
1810(L4)
20

Fig. 18

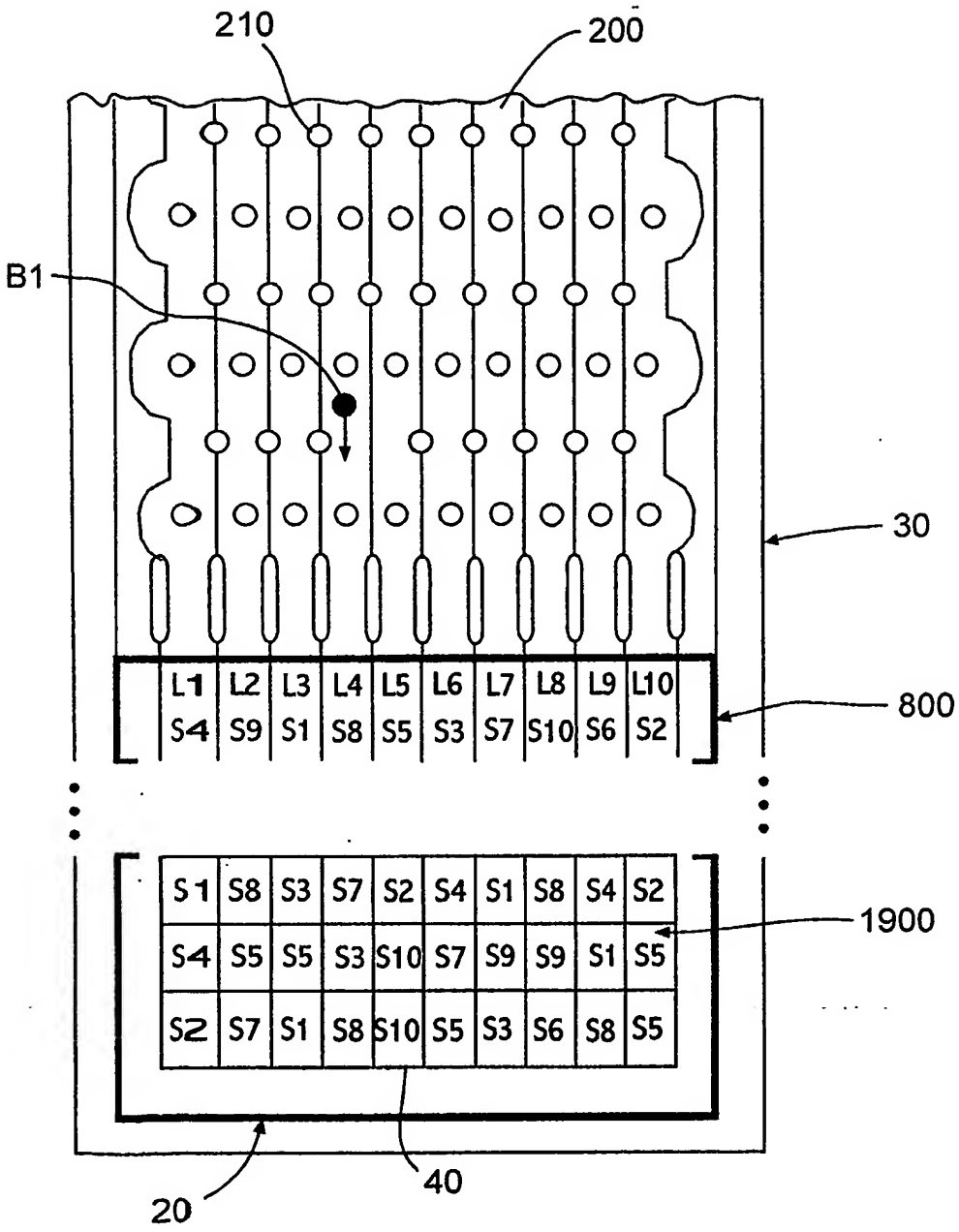

210
200
B1
30
L1 L2 L3 L4 L5 L6 L7 L8 L9 L10
S4 S9 S1 S8 S5 S3 S7 S10 S6 S2
800
S1 S8 S3 S7 S2 S4 S1 S8 S4 S2
S4 S5 S5 S3 S10 S7 S9 S9 S1 S5
S2 S7 S1 S8 S10 S5 S3 S6 S8 S5
1900
20
40

Fig. 19

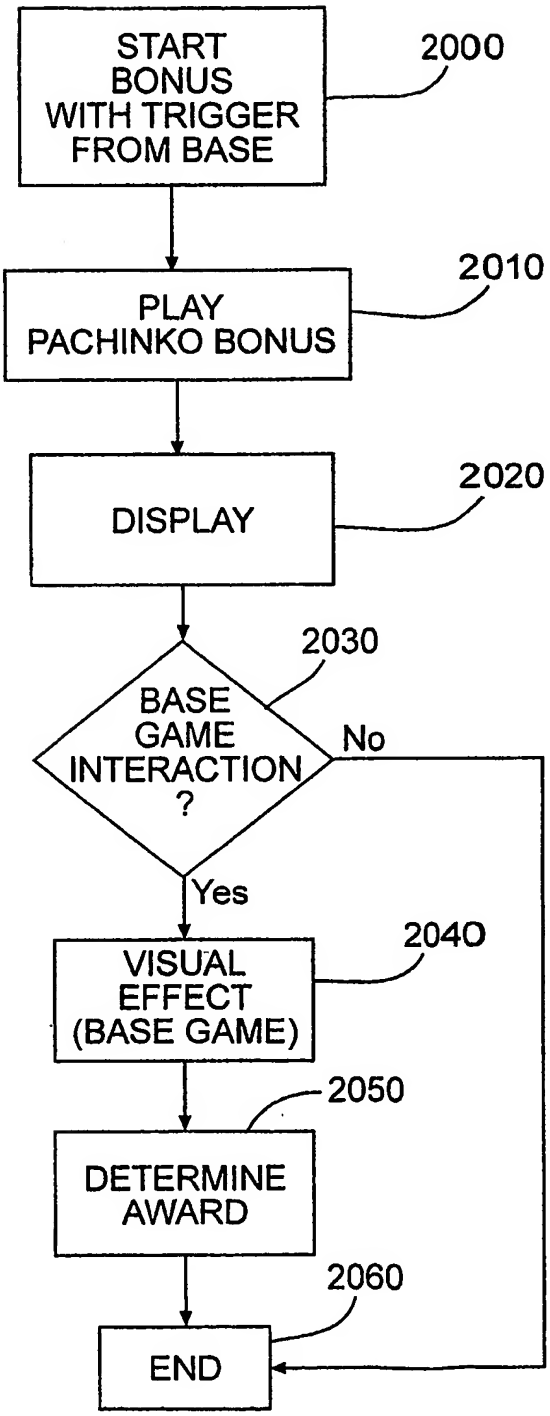

START BONUS WITH TRIGGER FROM BASE
2000
PLAY PACHINKO BONUS
2010
DISPLAY
2020
BASE GAME INTERACTION ?
2030
No
Yes
VISUAL EFFECT (BASE GAME)
2040
DETERMINE AWARD
2050
END
2060

Fig. 20

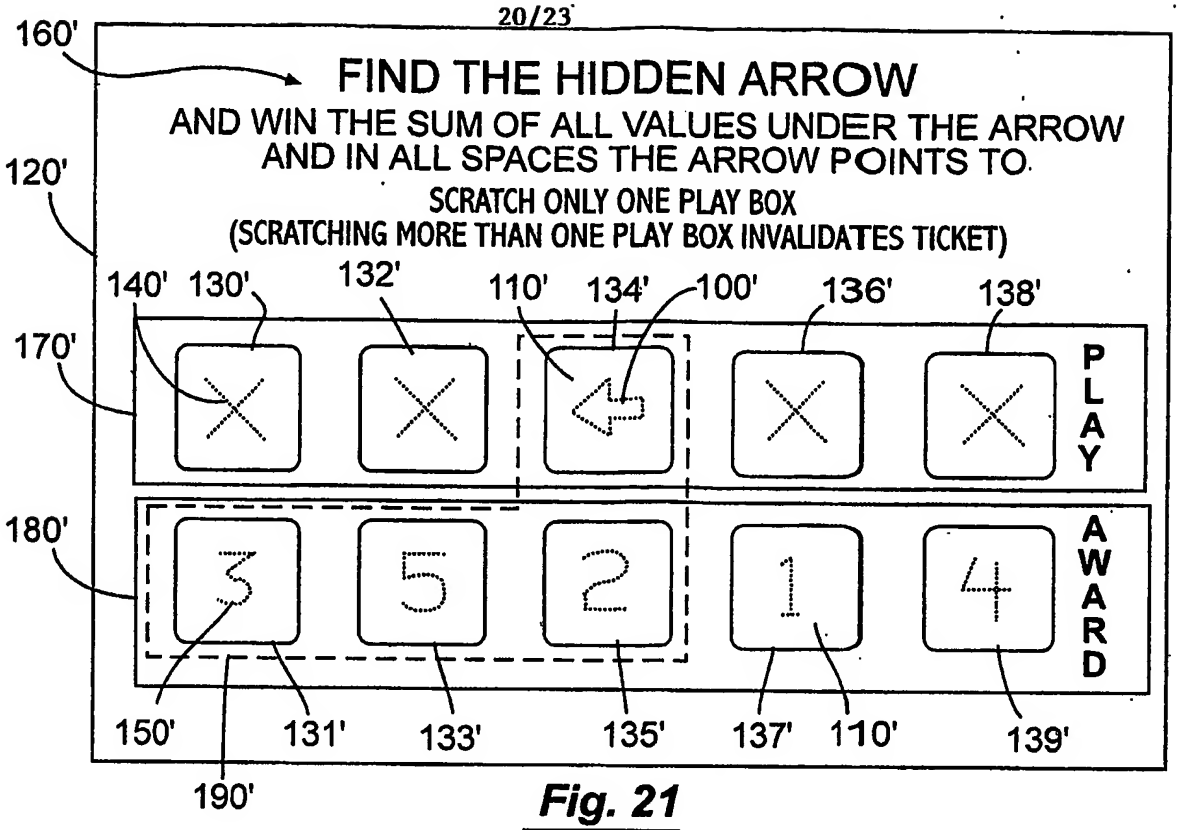

160'
FIND THE HIDDEN ARROW
AND WIN THE SUM OF ALL VALUES UNDER THE ARROW
AND IN ALL SPACES THE ARROW POINTS TO.
SCRATCH ONLY ONE PLAY BOX
(SCRATCHING MORE THAN ONE PLAY BOX INVALIDATES TICKET)
120'
140' 130' 132' 110' 134' 100' 136' 138'
170'
PLAY
180'
3 5 2 1 4
AWARD
150' 131' 133' 135' 137' 110' 139'
190'

Fig. 21

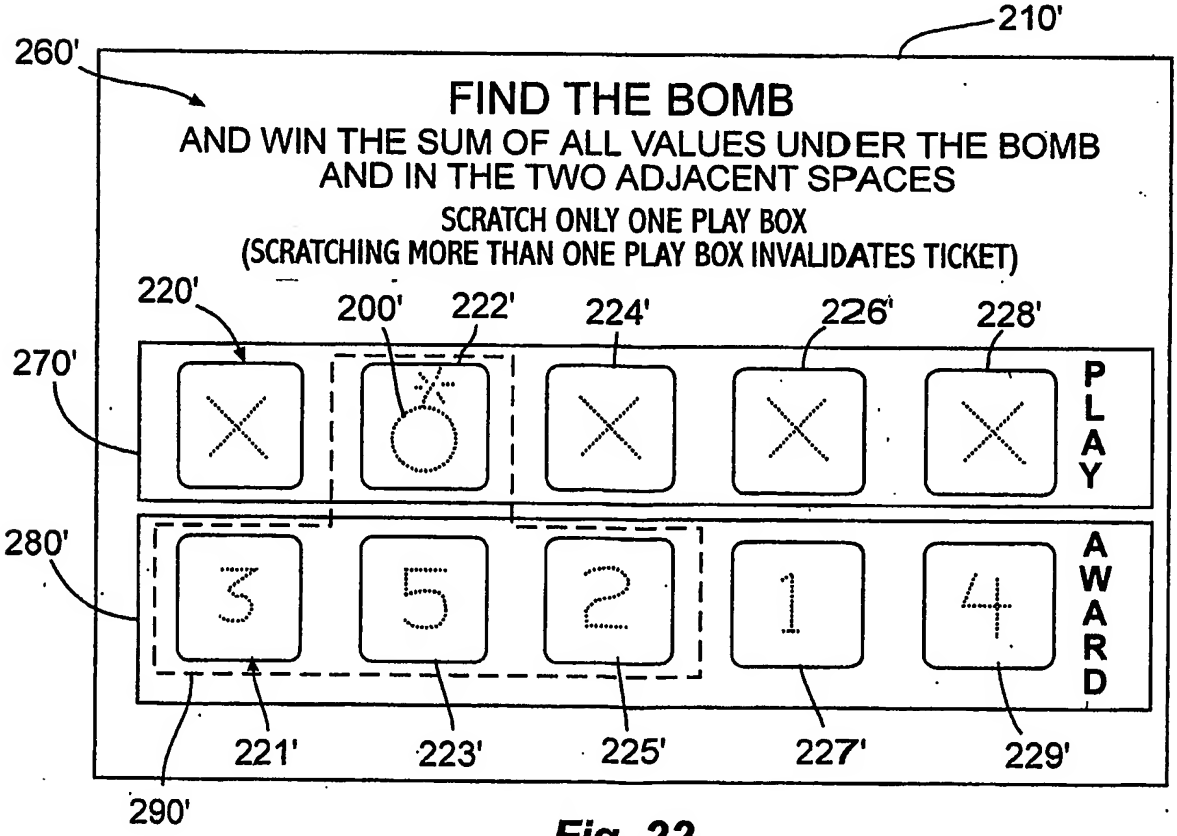

210'
260'
FIND THE BOMB
AND WIN THE SUM OF ALL VALUES UNDER THE BOMB
AND IN THE TWO ADJACENT SPACES
SCRATCH ONLY ONE PLAY BOX
(SCRATCHING MORE THAN ONE PLAY BOX INVALIDATES TICKET)
220' 200' 222' 224' 226' 228'
270'
PLAY
280'
3 5 2 1 4
AWARD
221' 223' 225' 227' 229'
290'

Fig. 22

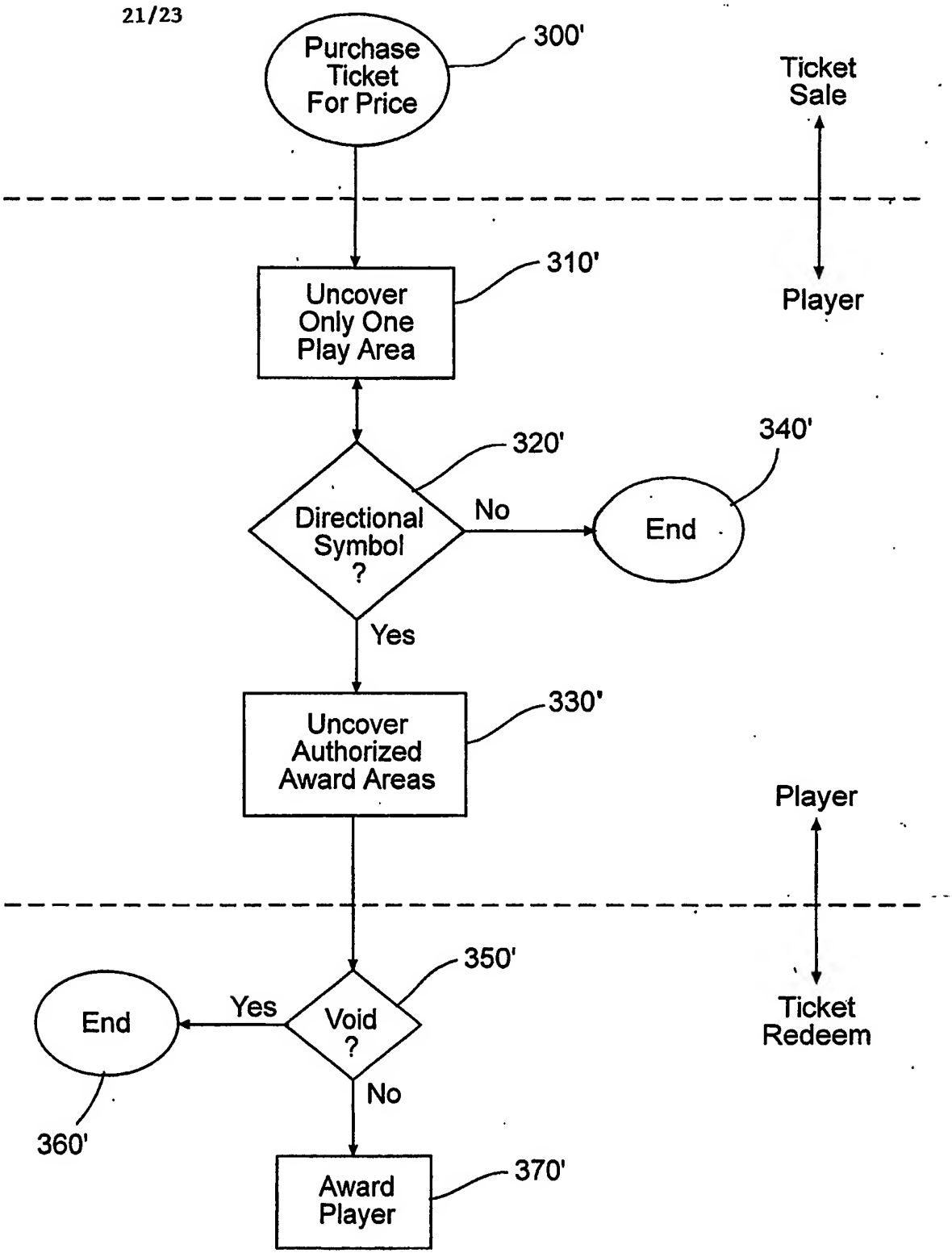

Purchase Ticket For Price
300'
Ticket Sale
Player
Uncover Only One Play Area
310'
Directional Symbol ?
320'
No
End
340'
Yes
Uncover Authorized Award Areas
330'
Player
Ticket Redeem
Void ?
350'
Yes
End
360'
No
Award Player
370'

Fig. 23

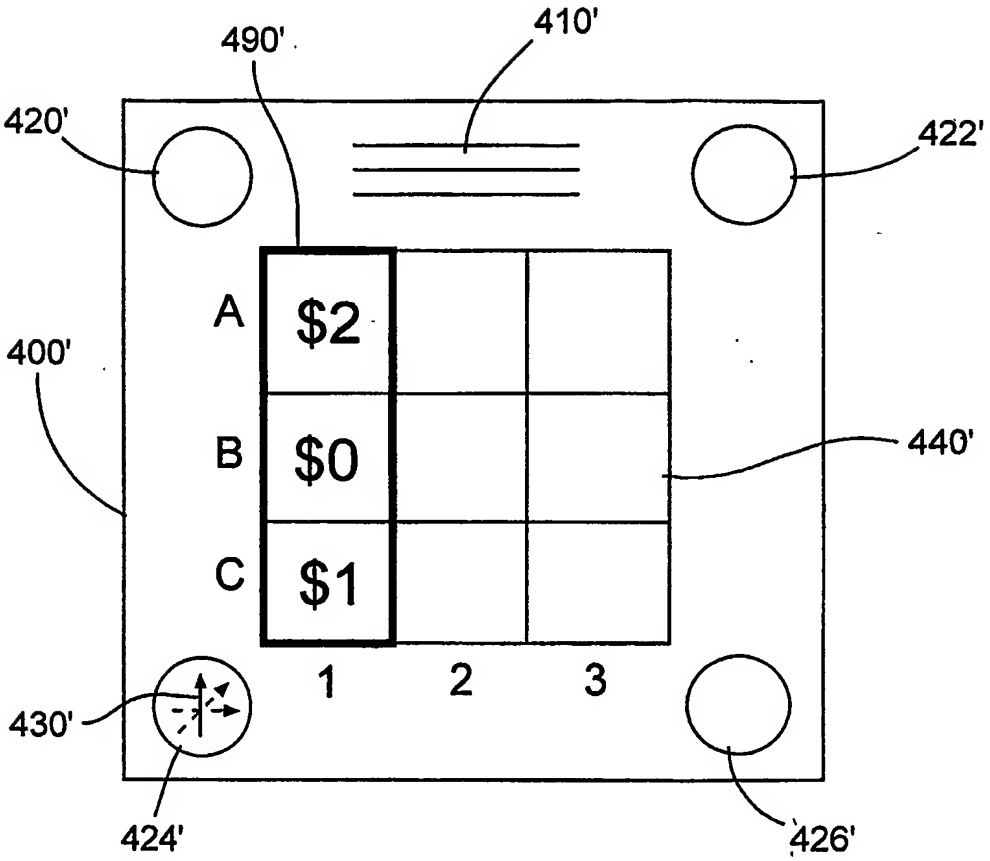


Fig. 24

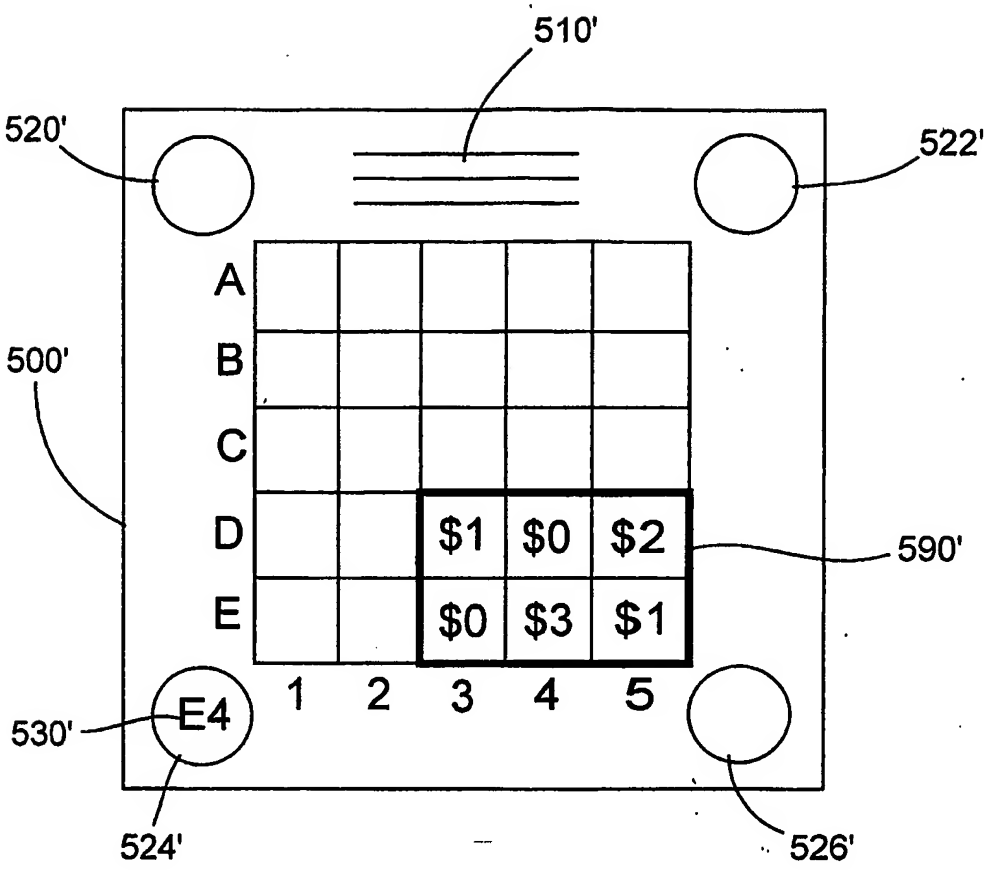


Fig. 25

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US05/09973

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) : A63B 71/00; A63F 1/00, 13/00, 1/18, 9/24; G06F 17/00, 19/00
US CL : 273/138, 139; 463/20
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 273/126, 138, 139, 463/20

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
NONE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6,340,158 B2 (PIERCE ET AL.) 22 January 2002 (22 01.2002), See entire document.	1-35
A	US 6,047,963 A (PIERCE ET AL.) 11 April 2000 (11.04.2000), See entire document.	1-35
A	US 6,139,013 A (PIERCE ET AL.) 31 October 2000 (31.10.2000), See entire document.	1-35

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search
24 August 2005 (24.08.2005)

Date of mailing of the international search report
15 SEP 2005

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Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
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Alexandria, Virginia 22313-1450
Facsimile No. (703) 305-3230

Authorized officer
Linda Sholl Sharon N. Greene for
Telephone No. 571-272-4391

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